State of Wisconsin
Department of Health Services
Emergency Medical Services Section

State of Wisconsin

Standards & Procedures of

Practical Skills Manual

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This manual is intended to provide examples of tried and proven techniques of caring for patients with the various injuries or illnesses that EMS personnel will encounter in the field. It does not provide the only method or technique that may be an acceptable approach in caring for an injury or illness. However, since the various certification examinations used within the state are based on the current edition of this document as well as the current edition of the US DOT National Standard Curriculum, the State of Wisconsin EMT Basic: A Practice-Based Approach to EMS Education and the State of Wisconsin Scope of Practice, it is an advantage to use these skill procedures as the basis for practice. This is a consensus document, endorsed by the EMS Training Centers, the Bureau of Local Public Health Practice and EMS of the Department of Health Services as well as the EMS Physician Advisory Committee. Bureau of Local Public Health Practice and EMS, Wisconsin's EMS State Medical Director, the EMS Physician Advisory Committee, as well as regional and local physician medical direction are charged with developing and promulgating these minimum standards of care for EMS providers

This manual contains descriptions of those skills included in the scope of practice for all EMS personnel. The scope of practice for each level of provider, as defined by the EMS Section of the Bureau of Local Public Health Practice and EMS and local protocol, shall define which of these skills may be used at each provider level.

State of Wisconsin – Standards & Procedures of Practical Skills

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SECTION 1 – ASSESSMENT TOOLS: BLOOD PRESSURE MEASUREMENT; PULSE OXIMETRY; BLOOD GLUCOSE MEASUREMENT

TEACHING POINTS

OBJECTIVES:
1. To consistently obtain an accurate blood pressure measurement through the use of auscultory and palpatory methods
2. To objectively measure the percent of circulating hemoglobin saturated with oxygen.
3. To accurately measure the blood glucose level through the use of a glucometer

I. BLOOD PRESSURE MEASUREMENT

IMPORTANT POINTS:
1. Correctly size and position the blood pressure cuff
2. Locate the brachial artery pulse in the antecubital space
3. Inflate the cuff 30 mm Hg above the point at which the pulse is lost
4. Deflate cuff proportionate to the rate of the pulse and record the results.

SKILL:

A. PALPATION METHOD
   1. Position the patient with the arm at heart level
   2. Apply the cuff snugly around the extremity with the lower edge at least one (1) inch above the antecubital space with the cuff's bladder centered over the brachial artery
   3. Palpate the brachial or radial pulse.
   4. Inflate the blood pressure cuff to 30 mm Hg above the point at which the pulse disappears
   5. Deflate cuff slowly while noting the reading at which the pulse is felt to return
   6. Record systolic blood pressure as #/P

Too large a cuff will give a false low reading
Too small a cuff will give a false high reading.

B. AUSCULTORY METHOD
   1. Position the patient with the arm at heart level
   2. Apply the cuff snugly around the extremity with the lower edge at least one (1) inch above the antecubital space and the cuff's bladder centered over the brachial artery
   3. Insert stethoscope earpieces in ears with earpieces pointing slightly forward: test diaphragm for sound conduction by gently tapping on diaphragm
   4. Palpate or auscultate brachial artery while inflating cuff to 30 mm Hg above the loss of pulse
   5. Deflate cuff slowly with stethoscope diaphragm over brachial artery, noting the systolic and diastolic pressures

II. PULSE OXIMETRY

Important Points:

1. Do not depend on oximeter reading alone to assess patient's oxygenation status

The accuracy of the measurement may be affected by low blood flow, CO poisoning, nail polish, gel nails, dirt, jaundice, pt. movement, bright light. If pulse does not correlate with the machine, the accuracy of the reading should be questioned

SKILL:

A. Select and place the appropriate transducer on the patient (finger, toe, earlobe, etc.)
   1. Clean site with alcohol wipe, if necessary
   2. Tape around great toe or foot –pediatric patient
   3. Tape across the bridge of the nose-pediatric transducer on adult patient.
B. Turn on monitor.
C. Verify that pulse reading on oximeter is equal to patient's pulse.
D. Note and record reading

A pediatric adhesive style transducer can be utilized for an adult patient when the finger does not provide a reading. Adhere the transducer over the bridge of the patients' nose.

III. BLOOD GLUCOSE MEASUREMENT

Important Points:

1. Use appropriate body substance isolation precautions
2. Record reading in mg/dL
3. Consider use on all patients with altered level of consciousness
4. Ensure unit is calibrated
5. Check expiration date on test strips

SKILL:

1. Prepare equipment (glucometer, lancet device, alcohol wipes, band-aid) in advance, according to manufacturer's recommendations
2. Clean finger with alcohol prep pad, allowing alcohol to dry for 30 seconds
3. Turn unit on
4. Confirm test strip code with glucometer display reading
5. Prick finger with lancet to obtain blood sample
6. Apply sample to test strip
7. Cover puncture site with band-aid if bleeding continues
8. Properly dispose of lancet
9. Note and record reading

Protocols may suggest wiping away first drop of blood, using second drop for sample.

TEACHING POINTS

SECTION 2 – LIFTING AND MOVING PATIENTS

Ortho stretcher should be moved to this section as it is used for more than just spinal injury.

OBJECTIVES:

1. To provide mechanisms of patient movement and transport, which eliminate or minimize the potential for further patient injury while providing a rate of transport of movement appropriate to existing emergency conditions
2. To provide mechanisms of patient movement and transport, which provide the greatest degree of patient and rescuer safety

SKILL:

EMERGENCY MOVES: When using emergency moves it is assumed the patient must be moved to a position of relative safety immediately and no time is available to begin an assessment or provide spinal immobilization

IMPORTANT POINTS:

1. The greatest danger in moving a patient quickly is the potential of aggravating a spine injury
2. Always pull in the direction of the long axis of the patient's body
3. Do not pull a patient sideways; avoid bending or twisting the patient's torso
4. The patient should be supine whenever possible

A. BLANKET DRAG
   1. Place patient on blanket
   2. Drag blanket in direction of long axis of patient's body
      a. Keep head as close to floor as possible
      b. Move patient head first whenever possible

Only three emergency moves are listed here; there are many more acceptable emergency moves.

B. CLOTHES DRAG
   1. Grasp patient's clothing pulling from the neck or shoulder area
   2. Drag in direction of the long axis of the patient's body
      a. Keep patient's head as close to the floor as possible
      b. Drag in direction of the long axis of the body

	TEACHING POINTS
C. ONE-RESCUER DRAG 1. Place hands under the patient's armpits from the back 2. Grasp the patient's forearms and drag in the direction of the long axis of the body	
URGENT MOVES: Urgent moves are required when the patient must be moved quickly but adequate time is available to perform an initial assessment and provide spinal immobilization precautions	
IMPORTANT POINTS: 1. The greatest danger in moving a patient quickly is the potential of aggravating a spine injury 2. Always pull in the direction of the long axis of the patient's body 3. Do not pull a patient sideways; avoid bending or twisting the patient's torso 4. The patient should be supine whenever possible	
D. RAPID EXTRICATION (Patient sitting in vehicle) 1. First rescuer brings cervical spine into neutral, in-line position and provides manual stabilization 2. Second rescuer applies cervical immobilization device (rigid cervical collar) 3. Third rescuer positions the foot-end of a long spineboard at the door opening, then moves to opposite side of patient 4. Second rescuer supports and stabilizes the patient's torso as the third rescuer frees the patient's legs 5. At the direction of the rescuer holding manual C-spine stabilization, the patient is rotated in several short, coordinated moves until the patient's back is in the open doorway and his/her legs are on the seat 6. The end of the long spineboard is placed against the patient's buttocks. Additional rescuers support the opposite end of the board as the first and second rescuers lower the patient to the board 7. The second and third rescuers slide the patient into the proper position on the board in short coordinated moves while the first rescuer maintains manual C-spine stabilization 8. First rescuer maintains manual stabilization as the patient is moved to a place of relative safety	Manual C-spine stabilization may need to be transferred between rescuers during body rotation because of vehicle obstacles

TEACHING POINTS

E. HORSE COLLAR EXTRICATION (patient sitting)

OBJECTIVES:
1. To permit emergency extrication of a patient when their condition does not allow the time required to apply full head and torso immobilization with a short extrication device
2. To permit emergency extrication in a hazardous situation (fire, haz/mat, etc)
3. To provide an alternative extrication technique when a short immobilization device is not available
4. To permit emergency patient movement when only one rescuer is available

SKILL:
1. Hold a full size cloth blanket diagonally at opposite corners: Loosely swing like a jump rope to make a bulky, long cravat
2. Position the blanket for C-spine control and movement
   a. Place the middle of the blanket behind the patient's neck
   b. Bring the ends over the shoulders
   c. Cross the blanket in front of the chest
   d. Pass the ends under the armpits
   e. Cross the ends behind the patient's back
3. Hold the blanket ends close to the armpits
4. Tilt the patient's upper body to clear the doorframe as needed
5. Slide the patient off and lower into a sitting position onto the ground or directly on to a long spineboard
6. Lower the patient to a supine position

Manual C-spine stabilization may be done if time and personnel allow

Hold the blanket snuggly against the neck to provide support

Twisting the ends may provide better stabilization and control of the patient

NON-URGENT MOVES: Non-urgent moves are those moves, which are used when adequate time is available to perform a thorough assessment and provide all appropriate immobilization precautions

F. DIRECT GROUND LIFT (no suspected spinal injury)
   1. Two or three rescuers line up on one side of the patient
   2. Rescuers kneel on one knee (preferably the same knee for all rescuers)
   3. The rescuer at the head places one arm under the patient's neck and shoulders while cradling the patient's head. S/he places the other hand under the patient's lower back

TEACHING POINTS

4. The second rescuer places one arm under the patient's knees and the other arm just above the patient's buttocks
5. If a third rescuer is available, s/he should place both arms under the patient's waist and the other rescuers should slide their arms either up to the mid-back or down to the buttocks as appropriate
6. On signal, the rescuers lift the patient to their knees and roll the patient toward their chests
7. On signal, the rescuers stand and move the patient to the stretcher
8. To lower the patient, the steps are reversed

G. EXTREMITY LIFT (no suspected spinal or extremity injuries – patient supine)

1. Properly position the stretcher beside the patient
2. One rescuer kneels at the patient's head and one kneels at the patient's side by the knees
3. The rescuer at the head places one hand under each of the patient's shoulders while the rescuer at the foot grasps the patients wrists and pulls the patient to a sitting position
4. The rescuer at the head slips his/her hands under the patient's arms and grasps the patient's wrists
5. The rescuer at the patient's feet places his/her hands under the patient's knees
6. Both rescuers move to a crouching position
7. Both rescuers stand simultaneously and move with the patient to the stretcher

H. SUPINE TRANSFER - Direct Carry

1. Position the stretcher perpendicular to the bed with the head end of the stretcher at the foot of the bed or the foot end of the stretcher at the head of the bed
2. Both rescuers stand between bed and stretcher, facing patient
3. First rescuer slides arm under patient's neck and cradles patient's head and shoulders
4. Second rescuer slides hands under patient's hips and lifts slightly
5. First rescuer slides other arm under patient's back
6. Second rescuer places arms under hips and calves
7. Rescuers slide patient to edge of bed
8. On signal, patient is lifted and curled toward rescuer's chests
9. Rescuers rotate and place patient gently on stretcher

I. SUPINE TRANSFER – Draw Sheet Method
   1. Loosen bottom sheet beneath patient
   2. Position stretcher next to and parallel to bed
   3. Prepare stretcher and adjust to bed height
   4. Rescuers then reach across stretcher and grasp sheet firmly at the patient's head, chest, hips and knees
   5. On signal, slide the patient gently onto stretcher

TEACHING POINTS
If a transfer board is used, it should be placed over the seam formed between the stretcher and bed

J. STAND AND PIVOT (seated patient)

OBJECTIVES:
1. To move a seated patient to the cot

IMPORTANT POINTS:
1. The patient must be able to bear some weight
2. One or two rescuers may be used
3. Position the cot close to the patient with its height about the same as a chair seat
4. The cot must be stabilized to avoid movement

SKILL:
1. While facing the patient, grasp the patient by the waistband or under the armpits
2. On the rescuer's count, assist the patient to a standing position
3. Assist the patient in turning (pivoting) so their posterior is toward the cot
4. Once the patient's legs are touching the cot, lower the patient to a seated position
5. Position the patient on the cot

The patient may want to hold onto the rescuer's shoulders. If the patient has footwear that will easily slide on the floor's surface, the rescuer may need to stand toe-to-toe with the patient to prevent slipping

Secure patient to device at chest, thighs and legs. Secure hands as appropriate.

K. EQUIPMENT MOVES:
   1. Stair Chair- Follow manufacturer's instructions for proper use
   2. Stretchers – Follow manufacturer's instructions for proper use

TEACHING POINTS

SECTION 3 – AIRWAY AND RESPIRATORY MANAGEMENT

OBJECTIVES:
1. To create a properly functioning oxygen delivery system, through the assembly of individual components, capable of providing appropriate oxygen concentrations for the purpose of patient resuscitation and inhalation therapy
2. To provide the proper positioning of an unconscious patient for the purpose of maintaining patency of the patient's airway
3. To facilitate the patency of a patient's airway through the use of basic and advanced airway adjuncts
4. To create a properly functioning suction system, through the assembly of individual system components, capable of removing foreign materials, blood, fluids and bodily secretions from the upper airway
5. To facilitate the removal of foreign body and/or displaced body tissues from the patient's upper airway through appropriate use of the Magill forceps and laryngoscope
6. To provide adequate resuscitation and/or ventilatory assistance through the use of adjunct airway devices to include: the bag-valve-mask, pocket mask, and flow restricted oxygen powered ventilation device (FROPVD)

GENERAL PRINCIPLES:
1. Use appropriate body substance isolation precautions
2. Always position the patient properly to assure an open airway
3. Open the airway using the head-tilt/chin lift or jaw thrust maneuvers
4. Modifications for maintaining the airway may be necessary due to the patient's injuries and/or condition
5. Confirm a patent airway by observing chest rise and fall, and air exchange
6. Artificial ventilation should never be delayed if airway adjuncts are not readily available

TEACHING POINTS

I. OXYGEN ADMINISTRATION/DISCONTINUANCE

IMPORTANT POINTS:

1. Oxygen cylinders must be handled carefully since the contents are under high pressure
2. Selection of a delivery device will depend on the patient's condition
3. Regulators reduce the cylinder's pressure to a safe level and regulate the flow of gas in liters per minute

SKILL:

A. OXYGEN ADMINISTRATION
   1. Identify oxygen cylinder by color, correct pin code and 100% USP marking
   4. Remove protective cap or tape
   5. Quickly open and close cylinder valve to "crack" so as to remove any impurities, which may have accumulated on the mating surfaces between the tank and regulator
   6. Attach regulator and flowmeter and insure a leakproof seal
   7. Turn on cylinder and check pressure gauge to insure adequate pressure
   8. Attach appropriate delivery device to flowmeter
   9. Adjust flow control to deliver recommended level
   10. Fit delivery device to patient
   11. Check adequacy of flow to patient

Cylinders should retain a safe residual volume of 500 psi or per local protocol

B. OXYGEN DISCONTINUANCE
   1. Remove oxygen delivery device from patient
   2. Shut off cylinder and bleed regulator
   3. Return flowmeter control to "off" position

II. PATIENT POSITIONING (Non-trauma unresponsive patient)

IMPORTANT POINTS:

1. This position may be useful for maintaining a patent airway and preventing aspiration in patients who are unable to properly protect their own airway
2. Airway, ventilations and vital signs should be monitored continuously

TEACHING POINTS

SKILL:

A. RECOVERY/LATERAL RECUMBANT POSITION
   1. Roll the patient onto their side while supporting the head and neck
   2. Flex uppermost leg and position knee to support weight
   3. Position lower arm out behind patient or place lower arm and forearm under head for support
   4. Position upper arm along side patient's face to assist in supporting weight
   5. Ease patient's head back and jut chin to facilitate airway

III. OROPHARYNGEAL AIRWAY INSERTION (Unresponsive patient with no gag reflex)

IMPORTANT POINTS:

1. Use appropriate body substance isolation precautions
2. Always measure airway
3. Use jaw thrust without head-tilt for patients with possible cervical spine injury
4. Tongue depressor or similar device may be used to ease insertion

SKILL:

A. Select airway by measuring from the corner of the patient's lips to the bottom of the earlobe or angle of the jaw
B. Open mouth using cross-finger technique
C. Insert airway
   1. Adult only – with tip pointing toward roof of mouth, insert airway until point touches soft palette, rotate 180 degrees into position with flange resting against lips or teeth
   2. Adult, child or infant – Using a tongue depressor or similar device. Move the patient's tongue forward and down. Insert airway in anatomical position so as to follow the normal curvature of the oropharynx until the flange rests against the lips or teeth
D. Check for adequate air exchange

TEACHING POINTS

IV. NASOPHARYNGEAL AIRWAY INSERTION (Responsive or unresponsive patient)

IMPORTANT POINTS:
1. Use appropriate body substance isolation precautions
2. If resistance is felt, remove and try other nare

SKILL:
- A. Visualize the nares and select a nasopharyngeal airway slightly smaller in diameter than the patient's largest nare
- B. Size the device by measuring from the tip of the patient's nose to the tip of the earlobe or angle of the jaw
- C. Lubricate the distal surface of the airway with water or a water soluble lubricant
- D. Insert the airway into the nare
  1. If placed in the right nare, insert so as to follow the normal anatomical curvature of the nasopharynx with the bevel toward the septum. Direct it along the floor of the nose and into the oropharynx
  2. If placed in the left nare, invert the airway so the bevel of the airway follows the septum of the nose. Once the tip of the airway reaches the nasopharynx, rotate the airway 180 degrees to resume alignment with the normal anatomical curvature of the nasopharynx. Continue to insert the airway into the oropharynx
- E. Check for adequate air exchange

V. NON-VISUALIZED ADVANCED AIRWAY INSERTION

IMPORTANT POINTS:
1. Use appropriate body substance isolation precautions
2. Ventilate the patient per AHA guidelines for a minimum of thirty (30) seconds prior to attempting placement.
3. Patient must have inadequate or absent breathing
4. Patient must not have a gag reflex and no foreign body airway obstruction
5. All contraindications for airway use must be considered prior to insertion
6. A maximum of thirty (30) seconds should be allowed for each airway attempt
7. A maximum of three (3) attempts per patient to place airway may be made
8. The patient should be ventilated per AHA guidelines for a minimum of thirty (30) seconds

TEACHING POINTS

between airway placement attempts

9. Definitive assurance of placement through proper auscultation of breath and gastric sounds must be made.
10. Removal, when necessary, should not be delayed by repeated attempts to contact medical control
11. The ability to suction the airway must be constantly available when inserting or removing the airway
12. Obtaining baseline breath sounds prior to advanced airway placement can assist with evaluation of tube placement

Gastric distention should be relieved by using gentle pressure to the abdomen. Suctioning of the oropharynx should be done according to suctioning S and P.

SKILL:

A. ESOPHAGEAL-TRACHEAL COMBITUBE (ETC)
   1. INSERTION
      a. Reconfirm assessment of absent or inadequate breathing without a gag reflex
      b. Determine cuff integrity
         1) Inflate cuffs
         2) Disconnect syringes
         3) Carefully inspect pharyngeal and distal cuffs
         4) Carefully inspect valves and pilot cuffs
         5) Deflate both cuffs
      c. Prepare all necessary accessories
         1) Preset inflation syringes to 100 mL and 15 mL (For Small Adult [SA] Model – Preset at 85 mL and 12 mL)
         2) Bag-valve-mask with supplemental oxygen
         3) Water soluble lubricant
         4) Suction device
         5) Stethoscope
      d. Suction as necessary; inspect patient's airway for obstructions, broken teeth, dentures, dental appliances, tongue piercings or other items that could damage cuffs
      e. Ventilate for a minimum of thirty (30) seconds
      f. Lubricate airway with water soluble lubricant as necessary

TEACHING POINTS

g. Position the patient supine with head in the neutral position. Do not hyperextend the patient's head
h. Remove oropharyngeal or nasopharyngeal airway if previously inserted
i. Inspect patient's airway for obstructions, broken teeth, dentures, dental appliances or other items that could damage cuffs

Teaching point: Use the tongue-jaw lift to open the airway. Use appropriate C-spine stabilization in cases of known or suspected trauma

j. While holding the patient's tongue and lower jaw to facilitate insertion:
   1) Insert Combitube airway-following the normal anatomical curvature of the oropharynx
   2) Insert firmly but gently until the insertion markers (two black lines which encircle the proximal end of the airway) are aligned on opposite sides of the patient's teeth or gums
      (a) Do not use force – If airway does not insert easily, withdraw and reattempt
      (b) Ventilate for a minimum of thirty (30) seconds between attempts
      (c) Maximum of thirty (30) seconds for each attempt
      (d) Maximum of three (3) attempts
      (e) Suction as necessary between attempts
k. When Combitube is positioned
   1) Inflate the pharyngeal cuff with 100 mL of air using large syringe (85 mL for Small Adult [SA] Model) through line #1 (blue)
   2) Insure Combitube has remained in proper position. (Combitube will move slightly with inflation)
   3) Remove syringe and insure pharyngeal cuff inflation has occurred by observing pilot balloon
   4) Inflate distal cuff with 15 mL of air using smaller syringe (12 mL for Small Adult [SA] Model) through line #2 (white)
   5) Remove syringe and insure distal cuff inflation has occurred by observing pilot balloon

Teaching point: Always be certain that both syringes stay with the patient as long as s/he is intubated with the Combitube

l. Ventilate the patient
   1) Attach bag-valve-mask (BVM) to primary tube #1 (blue) and ventilate patient
   2) While ventilating, confirm tube placement by auscultation of breath and epigastric sounds
      (a) Assess breath and epigastric sounds
         i. Esophageal placement
            (1) Breath sounds present high axillary

Teaching point: The presence of certain chest injuries (i.e. pneumothorax, hemothorax, etc) will result in absent or diminished

(2) Breath sounds present bilaterally
(3) Epigastric sounds are absent
(4) Continue to ventilate through tube #1 (blue)

ii. Tracheal placement
(1) Breath sounds are not present high axillary
(2) Breath sounds are not present bilaterally
(3) Epigastric sounds are present
(4) Discontinue ventilation through primary tube #1 (blue)
(5) Ventilate through secondary tube #2 (clear)
(6) Reassess breath and epigastric sounds to confirm tracheal placement

iii. Unknown placement
(1) Breath sounds are not present high axillary
(2) Breath sounds are not present bilaterally
(3) Epigastric sounds are not present
(4) Deflate cuffs (blue then white)
(5) Reposition airway – withdrawing approximately ½ inch
(6) Reinflate cuffs with appropriate volume of air (blue then white)
(7) Begin ventilations through primary tube #1 (blue) and reassess breath and epigastric sounds to confirm placement
(8) Ventilate as appropriate

iv. Placement remains unknown
(1) Follow removal procedures
(2) Ventilate patient for minimum of thirty (30) seconds
(3) Reattempt placement (maximum of three (3) attempts) starting at the beginning of the insertion steps

2. REMOVAL
   a. Contact medical control (local protocol)
   b. Prepare suction and emesis collection devices
   c. Position patient in lateral recumbent position when feasible, observing appropriate C-spine precautions for trauma patients
   d. Use large syringe to deflate cuff #1 (blue) until pilot balloon is completely deflated

TEACHING POINTS

breath sounds on the affected side(s) even with proper placement

Local protocols may alter the sequence in which breath and epigastric sounds are checked. Regardless of the sequence order, epigastric and bilateral breath sounds must be assessed

Bilateral breath sounds, and/or epigastric sounds, may or may not be present due to reasons other than incorrect tube placement

Expect that the patient will vomit

TEACHING POINTS

- e. Use small syringe to deflate cuff #2 (white) until pilot balloon is completely deflated
- f. Immediately withdraw airway with a smooth and steady motion while maintaining normal curvature of the pharynx
- g. Suction as necessary
- h. Monitor the patient's airway and breathing closely
- i. Provide high-flow oxygen via non-rebreather mask
- j. Consider nasopharyngeal airway and assist ventilations as necessary

SKILL:

B. KING LTS-D ADVANCED AIRWAY

1. INSERTION
   - a. Reconfirm assessment of absent or inadequate breathing without a gag reflex
   - b. Determine correct size airway based on patient's height
   - c. Determine cuff integrity
     1) Inflate cuffs
     2) Disconnect syringes
     3) Carefully inspect pharyngeal and distal cuff
     4) Carefully inspect valve and pilot cuff
     5) Deflate cuffs
   - d. Prepare all necessary accessories
     1) Preset inflation syringe to correct amount for device size
     2) Bag-valve-mask with supplemental oxygen
     3) Water soluble lubricant
     4) Suction device
     5) Stethoscope
   - e. Suction as necessary; inspect patient's airway for obstructions, broken teeth, dentures, dental appliances, tongue piercings or other items that could damage cuffs
     - *Teaching point:* A chin lift or laryngoscope and tongue depressor can be used to lift the tongue anteriorly to allow easy advancement
   - f. Ventilate for a minimum of thirty (30) seconds
   - g. Lubricate airway with water soluble lubricant as necessary
   - h. Position the patient supine with head in the neutral or sniffing position. Do not hyperextend the patient's head
     - *Teaching point:* Obese patient may need padding under shoulders and upper back
2. Normal Insertion

a. Hold the King LTS-D at the connector with dominant hand
b. With non-dominant hand, hold mouth open and apply chin lift unless contraindicated by C-spine precautions or patient position
c. Using a lateral approach, introduce the tip into the corner of the mouth
d. Advance the tip behind the base of the tongue while rotating the tube back to midline so that the blue orientation line faces the chin of the patient
e. Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums
f. Deeper placement and subsequent retraction is preferred
g. When the King LTS-D is positioned
   1) Inflate cuffs to volume sufficient to seal the airway
   2) Attach ventilation device to the connector of the King LTS-D
   3) At the same time, gently bag the patient and withdraw the King LTS-D until ventilation is easy and free flowing
   4) Readjust cuff inflation to "just seal" volume
   5) Check breath sounds, epigastric sounds and chest rise and fall

3. Secure the airway
   a. Disconnect the ventilation device
   b. Aggressively tape the King LTS-D in the midline to the maxilla
   c. Avoid taping over gastric access lumen
   d. Reattach the ventilation device
4. Removal
   a. Remove the King LTS-D when protective reflexes have returned
   b. Contact medical control (local protocol)
   c. Prepare suction and emesis collection devices – suction as indicated
   d. Position patient in lateral recumbent position when feasible, observing appropriate C-spine precautions for trauma patients
   e. Deflate cuffs
   f. Immediately withdraw airway with a smooth and steady motion while maintaining normal curvature of the pharynx
   g. Monitor the patient's airway and breathing closely
   h. Provide high-flow oxygen via non-rebreather mask
   i. Consider nasopharyngeal airway and assist ventilations as necessary

TEACHING POINTS

Important that the tip of the device be maintained at midline to assure that the distal tip is properly placed in the hypopharynx/upper esophagus

During insertion, if tip is placed or deflected laterally, it may enter the periform fossa and will appear to bounce back upon full insertion and release.

Insertion can be accomplished via a midline approach by applying a chin lift and sliding the distal tip along the palate and into position in the hypopharynx – head extension may be helpful

TEACHING POINTS

VI. PHARYNGEAL SUCTION

IMPORTANT POINTS:
1. Use appropriate body substance isolation precautions
2. Always measure flexible catheter
3. Use cross-finger technique or tongue blade devices to prevent rescuer and/or patient injury
4. Apply suction after reaching insertion depth
5. Suction the mouth first, then the nose on infants

SKILL:
- A. FLEXIBLE/RIGID TIP
  1. Attach suction tip to suction device
  2. Measure flexible catheter from tip of earlobe to corner of mouth to determine insertion length
  3. Switch on suction unit (or begin pumping) and insure suction is present
  4. Open mouth using cross-finger technique or tongue blade device
  5. Insert suction device to oropharynx with no suction at tip
  6. Suction across oropharynx (maximum of 15 seconds for adult patient)
  7. Remove device while maintaining suction
  8. Flush system with water as necessary
  9. Check for adequate air exchange
- B. BULB SYRINGE (Infants)
  1. Squeeze air from bulb prior to insertion
  2. Gradually reduce pressure on bulb to provide suction while removing from nose or mouth
  3. Check for adequate air exchange
  4. Repeat as necessary

Do not lose sight of the distal tip of rigid wands

For pediatric patients, shorter suction time should be used.

VII. LARYNGOSCOPE AND MAGILL FORCEPS

IMPORTANT POINTS:
1. Use appropriate body substance isolation precautions
2. The laryngoscope should never be pried or levered against the teeth

TEACHING POINTS

3. The Magill forceps should be held so the handle does not obstruct the view of the pharynx
4. This device is intended for use on unconscious patients

SKILL:

1. Choose appropriate-sized forceps, laryngoscope handle and blade
2. Assemble blade and handle, insure light is bright and tightly secured in the blade
3. Place the patient's head in the "sniffing" position
4. Hold laryngoscope in left hand
   A. Adult patient – Hold handle with entire hand
   B. Infant patient – Hold handle with thumb, index and middle fingers
5. With the rescuer in the cephalic position, insert blade in right side of mouth and displace tongue to left by moving blade to midline
6. In infant: Support chin with ring and little fingers of left hand for leverage
7. Lift tongue in direction of long axis of the handle without prying on teeth or gums
8. Visualize obstruction
9. Holding the Magill forceps in the right hand, remove obstruction
10. Visualize airway for further obstructions before removing laryngoscope blade
11. Check for adequate air exchange

Curved blades are to be used for foreign body removal

IX. BAG-VALVE-MASK VENTILATION

IMPORTANT POINTS:

1. Use appropriate body substance isolation precautions
2. This technique should be used with supplemental oxygen to deliver high concentrations of oxygen
3. Inflate only enough to make visible chest rise
4. The bag-valve-mask may be used on patients who are not breathing or patients who are breathing but not exchanging adequate amounts of air
5. This procedure should be performed as a two rescuer technique whenever possible
6. Appropriate C-spine considerations should be taken when managing patients with potential spinal injuries

Discuss pediatric pop-off valves

SKILL:

1. Select and insert appropriate airway adjunct

Do not delay ventilations to attach

TEACHING POINTS

2. Select adult, pediatric or infant size bag-valve-mask and assemble components
3. Attach oxygen supply to bag-valve-mask; adjust oxygen supply to recommended level
4. Seal mask on patient's face while maintaining head-tilt, chin-lift or attach to advanced airway adjunct fitting
5. Squeeze bag, ventilating patient according to AHA guidelines
6. Observe chest rise and fall with each ventilation. If no chest rise, reassess equipment, technique and patient
7. If two rescuers are available, one rescuer uses two hands to maintain the airway and mask seal, while the second rescuer uses two hands to compress the bag to provide ventilations

supplemental oxygen

Use modified jaw thrust with C-spine stabilization if potential for spinal injury exists

X. FLOW-RESTRICTED, OXYGEN-POWERED VENTILATION DEVICE (FROPVD)

IMPORTANT POINTS:
1. Use appropriate body substance isolation precautions
2. Prolonged depression of ventilation button may result in gastric distention
3. Proper airway positioning minimizes the potential of gastric distention
4. The FROPVD is not recommended for use with pediatric or chest trauma patients
5. Must be reduced to deliver no more than 40 LPM of oxygen
6. May be used by spontaneously breathing patients
7. Follow local medical protocols governing the use of this device
8. Appropriate C-spine considerations should be taken when managing patients with potential spinal injuries

SKILL:
1. Connect device to oxygen source
2. Open cylinder and check for leaks
3. Select and insert appropriate airway adjunct, if indicated
4. Press ventilation button to clear line and check operation
5. Seal mask on patient's face while maintaining head-tilt, chin-lift or attach to advanced airway adjunct fitting
6. Depress ventilation button until patient's chest rises
7. Release ventilation button and observe patient's exhalation
8. Ventilate per AHA guidelines

Use modified jaw thrust with C-spine stabilization if potential for spinal injury exists

TEACHING POINTS

XI. POCKET MASK

IMPORTANT POINTS:
1. Use appropriate body substance isolation precautions
2. Oxygen concentrations will be increased by attaching supplemental oxygen
3. Appropriate C-spine considerations should be taken when managing patients with potential spinal injuries

SKILL:
1. Select and insert properly sized oropharyngeal or nasopharyngeal airway, if available
2. Unfold pocket mask as appropriate and attach one-way valve
3. If available, attach oxygen delivery tube to oxygen source and to mask inlet
4. Turn on oxygen and adjust liter flow to recommended level
5. While maintaining head-tilt, chin-lift, seal mask on patient's face
6. Ventilate patient through one-way valve attached to mask until chest rises
7. Allow patient to exhale while maintaining mask seal to face
8. Ventilate per AHA guidelines

Do not delay ventilations to attach supplemental oxygen

Use modified jaw thrust with C-spine stabilization if potential for spinal injury exists

Remove one-way valve when attaching pocket mask to bag-valve device

TEACHING POINTS

SECTION 4 – PATIENT ASSESSMENT

General Information:
The assessment process recognizes that trauma patients and medical patients have different assessment priorities. Patients may be divided into four broad categories: Medical patients who are responsive; Medical patients who are not responsive; Trauma patients with a significant mechanism of injury (MOI); and, Trauma patients without a significant mechanism of injury. Trauma patients are assigned a category based on severity, or potential severity, of their injuries. Medical patients, on the other hand, are assigned based on their ability to participate, or not participate, in the assessment rather than on the severity of their illnesses.

OBJECTIVES:
1. To determine the presence or absence of actual or potential hazards which pose a threat to the health and safety of rescuers, patients or bystanders during rescuer operations and/or during transport
2. To determine the presence or absence of injury or illness through a systematic assessment process incorporating inspection, auscultation, palpation, and the taking of a patient history

Safety is paramount throughout the call

IMPORTANT POINTS:
1. Use appropriate body substance isolation precautions
2. ALWAYS conduct a scene size-up
3. If a scene is not safe, and cannot be made safe, do not enter
4. Always obtain a general impression of the patient and conduct an initial assessment of the patient's mental status, airway, breathing and circulation (including a visual check for life-threatening external bleeding) no matter how stable a patient appears
5. Patients who are not responsive should include those with an altered mental status and those who are unable to respond reliably or provide a history
6. Intervene immediately to correct any life-threatening problem
   Remember: Any airway, breathing, circulation problem or severe external bleeding, which cannot be managed during the initial assessment, mandates urgent transport with continued efforts to manage the problem en route
7. A patient's condition may deteriorate rapidly. Perform frequent reassessments of the patient's mental status, airway, breathing and circulation
8. If the patient becomes unstable at any time, immediately repeat the initial assessment

TEACHING POINTS

SKILL:

I. PATIENT ASSESSMENT

A. SCENE SIZE-UP
   1. Determine the Nature of Illness (NOI) or Mechanism of Injury (MOI)
      a. En route to scene:
         1) Dispatch information
         2) Other units at scene
      b. Upon arrival at scene:
         1) Inspect the scene
         2) Patient, family, witnesses, bystanders, other rescuers
   2. Use appropriate body substance isolation precautions
   3. Determine whether the scene is safe
      a. Environmental considerations
      b. Social considerations
      c. Crime scene considerations
      d. Unruly or violent persons
      e. Unstable surfaces
      f. Other hazards
      g. If the scene is not safe, make it safe, or do not enter
   4. Determine the number of patients
   5. Determine the need for, and request, additional resources prior to patient contact

B. INITIAL ASSESSMENT
   1. Form a general impression of the patient as you approach, while telling the patient your first name and explaining that you are an EMT
      a. Establish approximate age
      b. Establish gender
      c. Identify chief complaint
      d. Assess environment clues

TEACHING POINTS

   e. Identify any obvious life-threatening conditions requiring urgent intervention
   f. Intervene immediately to correct any life-threatening conditions
2. Assess the patient's mental status and provide C-spine stabilization as appropriate
   a. Speak to the patient
   b. **A**lert
      Responds to **V**erbal stimuli
      Responds to **P**ainful stimuli
      Unresponsive
3. Assess the patient's airway
   a. Is the patient talking or crying?
      1) Yes: Assess breathing
      2) No: Open airway
4. Assess the patient's breathing
   a. If the patient is not responsive, but breathing is adequate, open and maintain the airway and initiate oxygen therapy
   b. If the patient is not breathing adequately, open and maintain the airway, initiate oxygen therapy, utilize appropriate adjuncts and/or assist ventilations
   c. If the patient is not breathing, open and maintain the airway, utilize appropriate adjuncts and ventilate with supplemental oxygen

Discuss normal rates and adequate breathing for all age ranges.

5. Assess the patient's circulation
   a. Pulse - present
      1) Less than one-year-old: Palpate the brachial artery
      2) More than one-year-old and responsive: Palpate the radial artery
      3) More than one-year-old and unresponsive; or more than one-year-old with absent radial pulse: Palpate carotid pulse
   b. If pulse - absent
      1) Initiate CPR
      2) Implement AED protocol as appropriate
   c. Assess and control major external bleeding
   d. Assess skin color, temperature and condition (Assess capillary refill in patients under six years or age)
   e. Expose the patient, as needed
   f. Establish a field impression and differential diagnosis
6. Determine the patient's transport priority, consider ALS back-up

TEACHING POINTS

C. FOCUSED HISTORY AND PHYSICAL EXAM
1. Assign the patient to one of the four patient assessment categories to determine which of the following items apply to that patient. The sequence in which these items are performed may depend on circumstances, the number of available EMTs and the presence of life-threatening problems requiring urgent intervention. Remember: The patient's priority is constantly being evaluated and subject to change
2. Reconsider NOI or MOI as necessary
3. Obtain a SAMPLE history
   a. **S**igns and symptoms
   b. **A**llergies
      1) Medicines
      2) Foods
      3) Environmental
   c. **M**edications
      1) Prescriptions
      2) Over-the-counter
      3) Alternative medication, herbal supplements
   d. **P**ertinent/past medical history
      1) Heart disease
      2) Diabetes
      3) Seizures
      4) Recent hospitalizations
      5) Recent injuries
      6) Medical patients: previous similar episodes
   e. **L**ast oral intake
   f. **E**vents leading to the injury or illness

TEACHING POINTS

4. Assess baseline vital signs
   a. Breathing - rate, rhythm and quality
   b. Pulse - rate, rhythm and quality
   c. Blood pressure
   d. Pupils
   e. Skin color and condition (Capillary refill under 6 years of age) – if not previously done
5. Perform an appropriate physical exam
   a. Physical assessment conducted for a responsive medical patient or a trauma patient with no significant mechanism of injury should be based on the patient's chief complaint
   b. Rapid trauma assessment or rapid assessment for unresponsive medical
      1) DCAP/BTLS
      2) While maintaining manual stabilization, apply cervical collar only after neck has been assessed
      3) Assess for obvious signs of trauma, plus:
         a) Head: Crepitus
         b) Neck: Jugular vein distention, crepitus
         c) Chest: Paradoxical motion, crepitus, bilateral breath sounds (mid-axillary, mid-clavicular)
         d) Abdomen: Rigidity, guarding, distention
         e) Pelvis: Gently compress for pain or crepitus, inspect for incontinence, priapism
         f) All extremities: Distal circulation, movement and sensation
      4) Roll patient taking appropriate spinal precautions, and assess posterior
6. Assess history of present illness (OPQRST)
   a. **O**nset
   b. **P**rovocation
   c. **Q**uality
   d. **R**adiation
   e. **S**everity
   f. **T**ime

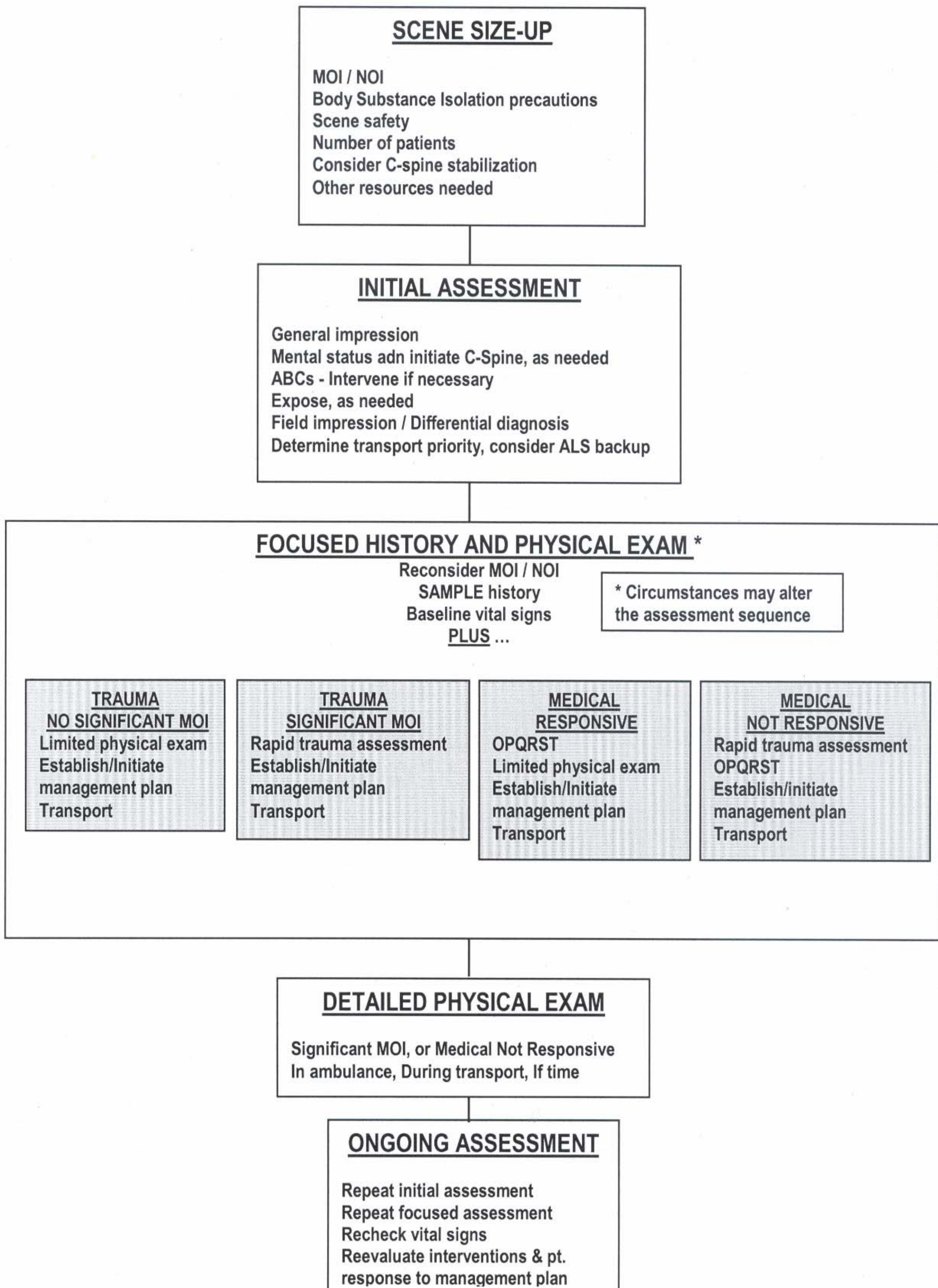
OPQRST may be used for evaluating pain associated with trauma injuries

7. Establish a management plan and initiate appropriate interventions
8. Reevaluate transport decision

TEACHING POINTS

D. DETAILED PHYSICAL ASSESSMENT
   1. Limited to the patient with a significant MOI or medical not responsive
   2. Performed as time permits, in the ambulance, during transport
   3. Repeat rapid trauma assessment with emphasis on:
      a. Ears: Drainage or blood, cerebral spinal fluid
      b. Eyes: Discoloration, equality, foreign bodies, blood in the anterior chamber
      c. Nose: Drainage of blood or cerebral spinal fluid
      d. Mouth: Loose or missing teeth, obstructions, soft tissue injuries
      e. Careful evaluation for potentially subtle signs on trunk and extremities

E. ONGOING ASSESSMENT
   1. Repeat initial assessment and reassess vital signs
      a. At least every five minutes for urgent, unstable or deteriorating patients
      b. At least every fifteen minutes for non-urgent, stable patients
      c. Any time the patient's condition is noted to change
   2. Repeat focused assessment regarding patient's chief complaint or injuries
   3. Reevaluate effectiveness of interventions and patient response to treatment
      a. Adequacy of oxygen delivery, assisted ventilations or artificial ventilations
      b. Management of soft tissue injuries
      c. Adequacy of other interventions


Patient Assessment
SCENE SIZE-UP
MOI / NOI
Body Substance Isolation precautions
Scene safety
Number of patients
Consider C-spine stabilization
Other resources needed
INITIAL ASSESSMENT
General impression
Mental status adn initiate C-Spine, as needed
ABCs - Intervene if necessary
Expose, as needed
Field impression / Differential diagnosis
Determine transport priority, consider ALS backup
FOCUSED HISTORY AND PHYSICAL EXAM *
Reconsider MOI / NOI
SAMPLE history
Baseline vital signs
PLUS ...
* Circumstances may alter the assessment sequence
TRAUMA
NO SIGNIFICANT MOI
Limited physical exam
Establish/Initiate management plan
Transport
TRAUMA
SIGNIFICANT MOI
Rapid trauma assessment
Establish/Initiate management plan
Transport
MEDICAL
RESPONSIVE
OPQRST
Limited physical exam
Establish/Initiate management plan
Transport
MEDICAL
NOT RESPONSIVE
Rapid trauma assessment
OPQRST
Establish/initiate management plan
Transport
DETAILED PHYSICAL EXAM
Significant MOI, or Medical Not Responsive
In ambulance, During transport, If time
ONGOING ASSESSMENT
Repeat initial assessment
Repeat focused assessment
Recheck vital signs
Reevaluate interventions & pt.
response to management plan

TEACHING POINTS

SECTION 5 – CARDIAC MANAGEMENT

I. CARDIOPULMONARY RESUSCITATION

All Cardiopulmonary Resuscitation procedures shall be performed as directed in the current American Heart Association guidelines

II. AUTOMATED EXTERNAL DEFIBRILLATION

All AED procedures shall be performed as directed in current American Heart Association guidelines in concurrence with local protocols/ DHS Sample Approved protocol

TEACHING POINTS

SECTION 6 - MEDICATION PREPARATION AND ADMINISTRATION

OBJECTIVES:

1. To prepare the appropriate delivery device for the purpose of administering medications
2. To prepare the appropriate delivery device for the purpose of administering fluids
3. To prepare the appropriate delivery device for the purpose of administering a medication via a nebulizer
4. To administer medication enteral and parenteral routes

IMPORTANT POINTS:

1. Use appropriate body substance isolation precautions
2. Medication must be administered in compliance with local protocols and medical direction
3. A comprehensive assessment must be performed on all patients to whom medications will be administered to determine:
   – Indication for medication
   – Contraindication(s) for medication
   – Appropriate dose for patient
   – Response to medication
4. All skills in this section assume the patient is being provided with supplemental oxygen as appropriate
5. Before administering any medication, always be certain you have:
   - The right patient
   - The right medication
   - The right dose
   - The right time
   - The right route
   - The right documentation
6. Prior to medication preparation and delivery, inspect the medication to insure it:
   – Contains the correct medication
   – Contains the correct dose
   – Has not expired
   – Has not been contaminated in any manner. Non-intact packaging may indicate loss of sterility

TEACHING POINTS

7. Documentation should include (per local protocol):
   - Medication
   - Dose delivered
   - Route
   - Site/method
   - Time given
   - Physician ordering medication
   - EMT delivering medication

I. ORAL, SUBLINGUAL AND BUCCAL MEDICATIONS

A. PREPARATION OF ORAL, SUBLINGUAL AND BUCCAL MEDICATIONS

1. Tablets
   a. Inspect the medication
   b. Shake out the proper number of tablets to obtain the proper dose
   c. Recheck the label for proper medication and dosage information
   d. Give directions to patient for medication administration
   e. The medication is now ready to be administered
2. Sublingual spray
   a. Inspect the medication
   b. Give directions to patient for medication administration
   c. The medication is now ready to be administered
3. Buccal (between cheek and gum):
   a. Inspect the medication
   b. Give directions to patient for medication administration
   c. The medication is now ready to be administered

The tablets should be placed in the lid of the medication bottle or an appropriate container

The medication should be transferred from the lid to the patient's hand or to the rescuer's gloved hand for administration

B. ADMINISTRATION OF ORAL, SUBLINGUAL AND BUCCAL MEDICATIONS

1. Prepare medication as previously described in this section
2. Recheck medication label for the rights
3. Explain procedure to the patient:
   a. Oral: Swallow the medication with a small amount of water
   b. Chewed: Chew the medication and do not swallow for about 10 seconds
   c. Sublingual: Place the medication under the tongue and do not swallow for 10

TEACHING POINTS

seconds

d. Sublingual spray: Spray on or under the tongue; be careful the patient does not inhale medication
e. Buccal: Apply medication between patient's cheek and gum

Buccal medication may be applied to a tongue depressor for administration

4. Give the medication to the patient to take or place medication in the patient's mouth
5. Assure the medication is swallowed, chewed or dissolved
6. Document medication administration
7. Provide an ongoing assessment of your patient to identify any effects of the medication

II. INHALED MEDICATIONS

A. PREPARATION OF INHALED MEDICATIONS

1. Metered dose inhaler
   a. Inspect the medication
   b. Shake the inhaler canister vigorously
   c. Wait 1-2 minutes between inhalations; shake canister before each inhalation
2. Nebulizer
   a. Select a nebulizer delivery method
      1) If using the hand held delivery, attach the reservoir hose and mouthpiece to opposite ends of the "T" fitting
      2) If using a mask delivery, use a nebulizer mask or remove the reservoir bag and the one-way valves (flaps) from a non-rebreather mask

Choosing between the "T" piece and mask is based on the patient's ability to hold the device and coordinate inhalation and breathing technique

   b. Assemble the medication cup by screwing the top and bottom sections together
   c. Inspect the medication
   d. Place the ordered dose of medication(s) into the medication cup and attach it to the bottom of the "T" fitting or mask

Most cups must be kept upright to avoid spilling the medication

   e. Attach the oxygen tubing to the inlet port of the medication cup. Attach the other end to an oxygen source capable of delivering a 4-6 lpm flow
   f. Turn on oxygen and adjust flow for best results

TEACHING POINTS

B. ADMINISTRATION OF INHALED MEDICATIONS
1. Metered dose inhaler
   a. Inspect the medication
   b. Verify the inhaler belongs to the patient
   c. Shake the inhaler canister vigorously
   d. Explain procedure to the patient:
      1) Forcibly exhale
      2) Place lips around the inhaler
      3) Activate inhaler with deep inhalation
      4) Hold breath as long as comfortably able
   e. Remove supplemental oxygen from the patient if needed for the medication administration
   f. Assist with medication administration as needed
   g. Replace oxygen and encourage patient to take several deep breaths
   h. Repeat steps c-g to obtain ordered dosage(s). Wait 1-2 minutes between inhalations

2. Nebulizer
   a. Assemble nebulizer delivery device as previously described in this section
   b. Recheck medication label for the rights
   c. Explain procedure to the patient:
      1) Seal lips around the mouthpiece of the hand held nebulizer or place mask on patient
      2) Take slow breaths and inhale as deep as possible
      3) Hold breath as long as comfortably able, up to 10 seconds
      4) Continue until the medication is gone; there is no misting

      Teaching point: The mist should "disappear" with each breath. Much of the mist that can actually be seen is too large to actually be absorbed
   d. Remove supplemental oxygen from patient
   e. Start nebulizer with oxygen at 4-6 lpm – adjust until it makes a fine mist

      Teaching point: Follow manufacturer's recommendation for liter flow
   f. Encourage patient to take slow, deep breaths until the medicine is gone from the medication cup
   g. Replace supplemental oxygen when the treatment is completed

      Teaching point: As the medication is administered and the level drops in the medication cup, the cup may need to be tapped to deliver all the medication

TEACHING POINTS

III. INJECTABLE MEDICATIONS

IMPORTANT POINTS
1. Maintain sterility of needles and medication for injections
2. Utilize safety engineered devices to minimize risk of needle sticks (mandatory except for auto-injectors)
3. Always ensure that all sharps are properly disposed of in a timely manner in an approved sharps disposal container
4. Route of administration and size of the patient are used to determine the appropriate size needle
   a. A 23- to 25-gauge, 5/8-inch-long needle is appropriate for subcutaneous injections.
   b. The needle gauge for I.M. injections should be larger to accommodate viscous solutions and suspension. Recommend 21G to 23G needles 1" to 2" in length

   As a rule of thumb, a 200-lb (90-kg) patient requires a longer needle (i.e. 2") for an IM injection; a 100-lb (45-kg) patient will require a 1 1⁄4" to 1 1⁄2" needle
5. Pre-filled systems may have an air bubble that will need to be purged prior to medication administration
6. When drawing up medication from a vial or ampule, draw up a little extra that can be wasted when purging air bubbles
7. Assure the proposed site for injection is free of inflammation, swelling, infection and any skin lesions
8. Never recap used needles
9. If blood is present when aspirating, withdraw the needle and discard the medication. Start over with new medication and a new site

   A. PREPARATION OF INJECTABLE MEDICATIONS
      SYRINGE AND VIAL
      1. Inspect the medication
      2. Select an appropriate size syringe for the medication to be delivered
      3. Remove the protective “flip-off” cap from the top of the vial
      4. Wipe the rubber stopper with an alcohol prep or other suitable antiseptic swab
      5. a. If reconstituting a medication:
            1) Pierce the center of the medication vial’s stopper with the needle on the syringe of diluting solution
            2) Inject diluting solution
            3) Remove the needle/syringe from the vial

Common practice is to use a larger needle for drawing up the drug, smaller needle for injecting

TEACHING POINTS

4) Gently shake the vial to assure the medication dissolves
5) Continue with drawing up the medication with a new needle and syringe repeating steps #1-4

b. If drawing a medication or diluting solution from a vial:
1) Draw up the same volume of air as the volume to be withdrawn
2) Pierce the center of the vial's stopper with the needle on the syringe
3) Inject air

6. Holding the vial upside down in one hand and being careful to keep the end of the needle within the fluid level of the vial, pull back gently on the plunger to draw the medication or diluting solution into the syringe
7. Withdraw the needle and syringe from the vial
8. Replace the needle with an appropriate size safety engineered needle for subcutaneous or IM injections
   - For comfort, change the needle prior to injection. Most needles have a fine silicon coating to facilitate easy entry into muscle mass. This may be lost when drawing up the medication. Also, literature has shown some rubber stoppers to contain trace amounts of latex that may cause a sensitivity reaction
9. With the needle pointing upward, gently tap the syringe to move any air bubbles to the top
10. Gently depress the plunger of the syringe until air is expelled and only the desired amount of medication remains in the syringe
11. The medication is now ready to be delivered

SYRINGE AND AMPULE

1. Inspect the medication
2. Select a syringe of appropriate size for the volume of medication to be delivered
3. Select a filter needle of appropriate size and length to withdraw the medication and attach to the syringe
   - Also called a "filter straw"
4. Hold the ampule upright and gently "flick" it to move any medication trapped in the head of the ampule to the base
5. Wipe the area between the head and base of the ampule with an alcohol prep or other suitable antiseptic swab

6. Once the medication is removed from the head of the ampule, use a commercially available device or a gauze square to grasp the head of the ampule and break the head from the base

TEACHING POINTS

Hold the ampule at arms length and break by snapping the top toward you. This will cause any glass shards to be directed away rather than toward you when the ampule breaks

If the ampule fails to break cleanly and glass shards can be observed, dispose of the ampule and replace with another

7. Using the filter needle and syringe withdraw medication for administration. Discard any remaining medication and properly dispose of both portions of the ampule in a sharps container
8. Remove the filter needle used to withdraw the medication from the ampule and properly dispose of the filter needle in an sharps container
9. Replace the filter needle with an appropriate size safety engineered needle for subcutaneous or IM injections
10. With the needle pointing upward, gently tap the syringe to move any air bubbles to the top of the syringe
11. Gently depress the plunger of the syringe until air is expelled and only the desired amount of medication remains in the syringe
12. The medication is now ready to be delivered

PRE-LOADED SYRINGES

1. Pre-filled Systems
   a. Inspect the medication
   b. Remove the protective caps from the medication cartridge and the barrel of the syringe assembly
   c. Insert the medication cartridge into the barrel assembly and rotate clockwise until the medication cartridge is secure in the barrel. The medication cartridge is now the plunger

TEACHING POINTS

d. With the unit now fully assembled, remove the protector from the distal tip and gently depress the plunger until air is expelled and only the desired amount of medication remains in the syringe
e. Attach an appropriate size safety engineered needle for subcutaneous or IM injections
f. The medication is now ready to be delivered

2. Syringe Cartridge Systems (e.g. Carpuject and Tubex)
   a. Inspect the medication cartridge
   b. Insert and secure the syringe cartridge into the cartridge holder following the manufacturer's directions
   c. Attach an appropriate size safety engineered needle for subcutaneous or IM injections
   d. With the unit now fully assembled, remove the protector from the distal tip and gently depress the plunger of the syringe until air is expelled and only the desired amount of medication remains in the syringe
   d.
   e. The medication is now ready to be delivered
3. Auto-injector systems
   a. Inspect the medication
   b. Remove the safety cap only after placing the device against the previously prepared injection site
   c. The medication is now ready to be administered

Never place your thumb or finger over the ends of the auto-injector

B. ADMINISTRATION OF INJECTABLE MEDICATIONS

INTRAMUSCULAR INJECTION

1. Prepare medication as previously described in this section
2. Recheck medication label for the rights
3. Ensure the correct size safety needle is attached for administration route (not applicable for auto-injector)
4. Select an injection site
   a. Deltoid
   b. Vastus lateralis (lateral thigh)

After selecting the injection site, gently tap it to stimulate the nerve endings which will minimize pain when the needle is inserted.

Using the stretch technique may accomplish this also

5. Cleanse the injection site with an alcohol prep or other suitable antiseptic swab in an outward circular motion for about 2 inches
6. Hold the syringe in dominant hand and remove the needle cover

Allow alcohol to dry for 30

7. Stabilize the injection site with your non-dominant hand using:
   a. "Pinch" technique
   b. Stretch technique
8. Holding the syringe like a dart, quickly but not forcefully, insert the needle into the injection site at a 90 degree angle until the proper depth is reached
9. Release the skin while continuing to hold the syringe in place with the dominant hand
10. Grasp the plunger with one hand and the barrel of the device with the other. Pull back (aspirate) slightly on the plunger and wait five seconds
11. If no blood aspirates into the syringe, proceed with the injection. Slowly depress the plunger to administer the injection (10 seconds per mL)
12. Once the medication has been administered, wait ten seconds, then withdraw the needle using appropriate safety features and/or activating the needle safety engineering device
13. Cover the injection site with an alcohol or gauze pad and apply gentle pressure to the area to help reduce pain and improve absorption
14. Properly dispose of the syringe and needle assembly in an appropriate sharps container
15. Place a bandage over the injection site

TEACHING POINTS

seconds for bacteria to be killed and to minimize discomfort of the injection

Prior to injection, tell the patient that they will feel a poke. Aspiration takes longer with smaller needles

A slow, steady injection rate allows the muscle to distend gradually and accept the medication under minimal pressure.

AUTO-INJECTOR

1. Prepare medication as previously described in this section
2. Recheck medication label for the rights
3. Select the vastus lateralis (lateral thigh) injection site
4. Cleanse the injection site with an alcohol prep or other suitable antiseptic swab in an outward circular motion for about 2 inches
5. Grasp the auto-injector by wrapping fist around the unit
6. Place black end of auto-injector against the prepared site on the lateral thigh at a 90 degree angle
7. Remove the gray protective cap
8. Stabilize the patient's leg to prevent pulling away

Allow alcohol to dry for 30 seconds for bacteria to be killed and to minimize discomfort of the injection

Never place your thumb or finger over the ends of the auto-injector

TEACHING POINTS

9. Apply a gentle pressure against leg with auto-injector until it clicks
10. Hold in place for 10 seconds before removing auto-injector
11. Properly dispose of the auto-injector in an appropriate sharps container
12. Place a bandage over the injection site

Teaching point: Prior to injection, tell the patient that they will feel a poke

SUBCUTANEOUS INJECTION

1. Prepare medication as previously described in this section
2. Recheck medication label for the rights
3. Insure the correct size safety needle is attached for administration route (not applicable for auto-injector)
4. Select an injection site
5. Cleanse the injection site with an alcohol prep or other suitable antiseptic swab in an outward circular motion for about 2 inches
6. Hold the syringe in dominant hand and remove the needle cover
7. Stabilize the injection site with your non-dominant hand using the "pinch" technique
8. Holding the syringe like a dart, quickly but not forcefully, insert the needle into the injection site at a 45-90 degree angle until the proper depth is reached
9. Release the skin while continuing to hold the syringe in place with the dominant hand
10. Slowly depress the plunger to administer the injection (10 seconds per mL)
11. Once the medication has been administered, wait ten seconds, then withdraw the needle using appropriate safety features
12. Cover the injection site with an alcohol or gauze pad and put gentle pressure on the area to help reduce pain and improve absorption
13. Properly dispose of the syringe and needle assembly in an appropriate sharps container
14. Place a bandage over the injection site

Teaching point: Allow alcohol to dry for 30 seconds for bacteria to be killed and to minimize discomfort of the injection

Teaching point: Shorter needles or patient size may affect the angle of injection

INTRAVENOUS BOLUS MEDICATIONS (IVP) - Assumes a patent IV is present

1. Prepare medication as previously described in this section
2. Recheck medication label for the rights
3. Insure the correct size safety needle is attached for administration route (not applicable for auto-injector)

3. Use an alcohol prep or other suitable antiseptic swab to wipe the surface of the IV tubing med-port closest to the patient
4. Remove the protective cap from the syringe
5. Connect the syringe to the prepared med-port by:
   a. Twisting clockwise for luer lock connections
   b. Inserting blunt cannula for ports designed for this safety device
   c. Inserting needle through self-sealing ports designed for needle puncture
6. Kink off the IV tubing between the selected med-port and the IV solution bag
7. Inject the medication at the proper rate
8. Disconnect syringe from med-port
9. Following injection of the medication, flush the IV tubing
   a. Bolus flush by syringe
   b. Open flow of IV
10. Properly dispose of the syringe and needle assembly in an appropriate sharps container

TEACHING POINTS

Allow alcohol to dry for 30 seconds for bacteria to be killed and to minimize injecting alcohol with the medication

IV. INTRAVENOUS ADMINISTRATION AND CARE

IMPORTANT POINTS

1. Maintain sterility of needles, ends of IV tubing and medication for injections
2. Utilize safety engineered devices to minimize risk of needle sticks (mandatory)
3. Always insure that all sharps are properly disposed of in a timely manner in an approved sharps disposal container.
4. Assure the proposed site for cannulation is free of inflammation, swelling, infection and any skin lesions
5. Never recap used needles
6. When drawing up medication from a vial or ampule, draw up a little extra that can be wasted when purging air bubbles

A. IV ADMINISTRATION SET PREPARATION

1. Select the appropriate solution
   a. Inspect the solution
   b. Open outer packaging by tearing pre-cut slit at either end of the bag
      1) Recheck clarity

Solution choice should be based on patient condition and local protocols

A slight amount of moisture inside

	TEACHING POINTS
	the outer bag is normal and not cause for concern

2. Select an appropriate IV administration set
3. Open the administration set
  a. Check to be certain the end caps that preserve the sterile field of the administration set remain in place
  b. Uncoil the tubing in preparation for spiking the IV bag
  c. If adjunct devices such as extensions or flow meters are to be used, they should be opened and attached to the administration set at this time
4. Move the flow control clamp to a convenient location and close off the IV tubing by:
  a. Rotating the control knob (roller clamp)
  b. Sliding the clamp (slide clamp)
  c. Pinching the clamp (pinch clamp)
	Choose between macro and micro infusion sets based on patient condition

5. Spike the IV bag
  a. Method one
    1) If not previously done, hang the IV bag with the tail ports extending downward
    2) Grasp the IV port just above the plastic tab. With the other hand, pull the plastic tab from the port. Be careful to maintain sterility of the port
    3) Remove the protective cap from the IV tubing spike being careful to protect the sterile field
    4) Insert the IV tubing spike into the IV port by pushing and twisting the spike until it punctures the seal of the port
	Whenever possible, the IV bag should be hung in a vertical position to facilitate preparation

5) Squeeze the drip chamber to fill it approximately half full of fluid
  b. Method two
    1) Holding the IV bag at its base, invert the bag so the tail ports extend upward
    2) While continuing to hold the IV bag, grasp its IV port just below the plastic tab. With the other hand, pull the plastic tab from the port. Be careful to maintain sterility of the port
    3) Remove the protective cap from the IV tubing spike being careful to protect the sterile field
    4) Insert the IV tubing spike into the IV port by pushing and twisting the spike until it punctures the seal of the port
    5) Invert the bag so it is in an upright position and hang the IV bag
	If too much fluid enters the drip chamber, invert the bag and drip chamber and squeeze some of the fluid back into the bag

TEACHING POINTS

6) Squeeze the drip chamber to fill it approximately half full of fluid

6. Place the end of the tubing in a convenient location while preserving sterility by keeping protective cap in place
7. Open the flow control clamp and allow the IV fluid to completely fill the line. It is often necessary to invert and "flick" med-ports with your fingers to remove larger air bubbles
8. Once the line is completely filled with fluid, and larger air bubbles removed, close the flow clamp and place the "primed" line in position for use

Some fluid may be flushed into the environment

Some protective caps do not allow fluid to flow once they are wet. If the protective cap needs to be removed to complete priming, maintain sterility and replace cap when tubing is primed

B. INITIATING VENOUS ACCESS

1. Prepare IV administration system as previously described in this section
2. Prepare the necessary equipment and supplies
   a. Sharps container
   b. Tape and/or commercially available device for securing the IV
   c. Alcohol prep pads or other suitable antiseptic swab
   d. Gauze pads
   e. Site dressing
   f. Tourniquet (latex free)
   g. Catheter(s)
   h. Band-aid
4. Select a venipuncture area (hand, wrist, forearm or antecubital space)
5. Apply a venous tourniquet approximately 4 to 8 inches above the selected area
6. Select a vein for cannulation and cleanse the intended venipuncture site with an alcohol prep or other suitable antiseptic swab in an outward circular motion for at least 2 inches
7. Based on the intent of the IV and the size of the vein selected, choose an appropriate size IV catheter
8. Remove the catheter from its packaging and the protective plastic sheath
9. Being careful to maintain the sterility of the needle and catheter, visually inspect the end of each for any defects, such as burred edges
10. Slightly twist the catheter on the needle to insure the catheter moves freely on the needle (optional step)

If tape is used, it should be torn to appropriate size and length prior to beginning the procedure

Use antiseptics per local protocol

Allow alcohol to dry for 30 seconds for bacteria to be killed and to minimize discomfort of the insertion

11. Grasp the patient's extremity near the area where the IV will be started using your non-dominant hand in order to stabilize the vein at the venipuncture site. This may be accomplished by:
    a. Pulling traction distal
    b. Holding extremity circumferentially so area is taut

TEACHING POINTS

Avoid placement that would shut off the blood supply and cause the vein to collapse.

In order to maintain sterility while placing IV, keep stabilizing hand and fingers out of the way of the catheter assembly

12. Insure the bevel of the needle is facing upward in relation to the patient's skin
13. Holding the catheter assembly with fingers of your dominant hand, and in such a manner as to be able to visualize the flash chamber, approach the injection site with the needle held at approximately a 15 – 20 degree angle
14. Inform the patient they will feel a slight "pinch" as the needle enters their skin
15. While continuing to apply traction to the skin to hold the vein steady, quickly, but carefully, enter the skin with the needle and continue until the needle tip is against the wall of the vein itself. Maintain traction and vein stabilization until catheter is in the lumen of the vein
16. Slowly advance the needle through the vein wall and into the lumen of the vein
17. Once you have entered the vein, continue to advance the needle and catheter assembly slightly (0.5 cm further) so the tip of the catheter enters the vein
18. When the catheter tip is within the lumen of the vein, slowly advance the catheter along the needle until the hub meets the patient's skin. Slide the catheter while holding the needle steady
19. After the catheter has been threaded into the vein, slightly pull back the needle from the catheter, but DO NOT withdraw it completely
20. If not drawing blood via the IV catheter, release the tourniquet. If blood draws are to be made using the IV catheter, leave the tourniquet in place and obtain blood samples before releasing tourniquet
21. Palpate the end of the catheter beneath the patient's skin and occlude the vein just proximal to the end of the catheter with direct pressure
22. Remove the needle and activate any safety features before disposing of it in an approved sharps container
23. With your free hand, remove the protective cap from the end of the IV tubing and attach it to the catheter hub, making sure not to push the catheter further in or pull it out
24. Open the IV flow clamp and observe the flow of fluid into the drip chamber
    a. If the IV does not flow:
        1) Insure the tourniquet has been released
        2) Carefully withdraw the catheter slightly while observing the drip chamber since the tip may be occluded by a valve or the side of the vein
        3) Determine if the IV is positional and troubleshoot as necessary
        2) Begin the process anew using another site

TEACHING POINTS

Consideration may be given to a bevel down approach for pediatric and geriatric patients with small veins

A "pop" may be felt as the needle enters the vein.

The flash chamber should fill with blood when entering the vein.

Smaller catheters will be slower to have a flash

Patients with poor perfusion may not have a significant flash

No more than one-half the length of the catheter should be below the skin at the point the needle enters the vein or only a small portion of the catheter will actually be within the vein for the finished IV

Review "luer lock" versus "slip tip" connections

TEACHING POINTS

b. With the IV running, and before securing the IV catheter in place, inspect the venipuncture site for signs of infiltration
c. If an IV can not be made to flow properly or infiltration is observed, discontinue the IV immediately

25. If the IV is observed to flow properly:
    a. Using a gauze pad or alcohol prep pad as necessary, wipe away any fluid or blood that may be present in order to dry the site sufficiently that tape will adhere
    b. Secure the IV and the IV tubing in place; cover insertion site with a sterile dressing or commercially available device
26. Secure the patient's extremity as appropriate to maintain flow
27. Adjust the flow rate by closing flow clamp or other flow-metering device to the appropriate setting
28. Continue to monitor the patient for:
    a. Signs of a fluid overload
    b. Other complications resulting from the IV
    c. Appropriate flow rate
    d. Infiltration
29. Continue to monitor the IV to insure appropriate flow rate is maintained and the venipuncture does not infiltrate

Many taping methods and commercial securing devices are available. Follow local protocols

Consideration must be given to maximum and/or ordered quantities of fluids

C. CHANGING THE SOLUTION BAG OF AN ESTABLISHED IV
1. Select and inspect the IV solution
2. Open outer packaging by tearing pre-cut slit at either end of the bag
3. Shut off the flow clamp on the nearly empty IV bag to prevent air from entering the IV tubing as the solution bag is being changed
4. Invert the nearly empty bag to prevent any remaining fluid from running out, and remove the IV tubing spike from the bag
    a. Use extreme care to ensure the IV tubing spike does not touch anything to contaminate the sterile field
    b. Follow one of the methods previously described in this section to puncture the bag
    c. Discard the used solution bag after noting the approximate amount of any remaining fluid
4. Reestablish the IV flow rate

TEACHING POINTS

D. DISCONTINUING AN IV
   1. Prepare the necessary materials
      a. Gauze square(s)
      b. Tape
      c. Band-Aid
      d. Disposal container
   2. Close the flow clamp of the IV administration set
   3. Gently remove the tape and/or securing device to expose the venipuncture site
   4. Cover the venipuncture site with a gauze square and apply gentle pressure as you remove the IV catheter
   5. Inspect the catheter to insure it is complete, noting any abnormalities
   6. Affix an adhesive bandage that will continue to apply pressure until bleeding has stopped
   7. Properly dispose of all materials
   8. Monitor venipuncture site for bleeding

TEACHING POINTS

SECTION 7 – MANAGEMENT OF SOFT TISSUE INJURIES

OBJECTIVES:
1. To control external bleeding
2. To prevent further injury and reduce pain
3. To prevent further wound contamination and reduce the potential of subsequent infection
4. To secure dressings through the application of appropriate bandaging techniques

GENERAL PRINCIPLES:
1. Use appropriate body substance isolation precautions
2. Expose the wound site to determine the extent of injury
3. Control bleeding by using the following techniques as needed: direct pressure, pressure dressing, elevation, pressure points, cold application and tourniquet
4. Use sterile dressings
5. Cover the entire wound site with the sterile surface of the dressing
6. Apply bandage snugly, making certain not to cut off circulation distal to injury site
7. Secure the dressing(s) with roller gauze or cravats applying gentle, even pressure over the wound site
8. Use the patient's brow ridge, chin and occipital ridge as necessary to provide natural anchoring points for bandaging
9. If the chin is used, monitor the patient carefully for airway problems. Cut bandage and fold flaps up if bandage interferes with airway or causes patient discomfort
10. Immobilize the injury site as appropriate
11. Consider shock and prevent/treat as appropriate: oxygen, patient positioning, maintenance of body temperature
12. CMS should be checked frequently and bandaging adjusted to maintain a pulse if necessary
13. Always consider the Mechanism of Injury (MOI)
14. Suspect cervical spine injury with significant MOI

TEACHING POINTS

I. HEAD

IMPORTANT POINTS:
1. Do not exert point pressure to scalp if underlying fracture is suspected
2.. Do not pack nose or ear to stop blood or cerebral spinal fluid (CSF) flow

SKILLS:
- A. HEAD (side wound)
  1. Open dressing to preserve sterile surface
  2. Apply sterile surface to wound site and control bleeding
  3. Anchor bandage securely under brow and occipital ridges
  4. Cover dressing completely with bandage
  5. Exert even pressure over entire wound site with finished bandage
  6. Leave eyes uncovered; leave ears either completely covered or completely uncovered

- B. HEAD (top wound)
  1. Open dressing to preserve sterile surface
  2. Apply sterile surface to wound site and control bleeding
  3. Anchor bandage securely under brow and occipital ridges
  4. Bring bandage over dressing and under chin and tighten down over dressing
  5. Cover dressing completely and apply even pressure with bandage over area
  6. Anchor bandage securely by making additional wraps around head, securing under brow ridge and occipital ridge
  7. Cut bandage under chin and fold ends up if it interferes with the airway
  8. Make last few turns around brow, overlapping folded section

II. EYE

IMPORTANT POINTS:
1. If areas around eye are lacerated but the eyeball is not involved, use direct pressure to control bleeding
2. If eyeball injury is suspected, close eye and apply loose dressing
3. If chemical burn is involved, irrigate eye with normal saline continuously
4. If thermal burns are involved, apply dressing moistened with sterile saline solution

TEACHING POINTS

5. If light burns are involved, cover eyes with moist, lightproof pads
6. Cover both eyes when injury occurs as consensual eye movement may cause further injury
7. Never touch the globe or the penetrating object with your hand
8. The finished bandage should hold the eye and/or penetrating object in place
9. Maintain verbal and physical contact with the patient as you explain your actions
10. Always irrigate from the bridge of the nose outward in order to avoid infecting or contaminating the uninjured eye

SKILLS:

A. EYE INJURY – Non-penetrating
   1. Have patient close eyes
   2. Apply sterile surface of dressing to injury(ies)
   3. Secure bandage around head, anchoring under occipital ridge
      a. Bandage snugly if eyeball is uninjured
      b. Bandage loosely if injury to the globe is suspected
   4. Cover both eyes with finished bandage; do not occlude mouth or nose
   5. Restrain patient's hands to keep from touching the eye area as needed

B. EYE INJURY – Penetrating
   1. Surround injured eye with sterile padding
   2. If penetrating object, cut hole in end of cup just large enough for object to pass through
   3. Place cup or cone over eye, resting it on pads, but do not touch the eye
   4. Secure the cup/cone to head with bandage wrapped around cup and then around head anchoring on occipital ridge
   5. Wrap bandage to cover uninjured eye, leaving the nose and mouth exposed
   6. Restrain patient's hands as necessary to prevent patient from touching the bandaged area

Teaching point: Do not cut a hole in dressings or padding as it may leave small particles of fabric in the eye

III. NECK

IMPORTANT POINTS:

1. Use an occlusive dressing to prevent air embolus from being sucked into jugular vein
2. DO NOT use a circumferential bandage around the neck

TEACHING POINTS

SKILL:
1. Place dressing over wound
2. Secure dressing in place by wrapping the bandage over the dressing and over the top of the opposite shoulder, crossing under the axilla and back again to form a figure eight
3. Unless contraindicated, transport patient on left side in moderate Trendelenberg position

IV. TORSO

IMPORTANT POINTS:
1. Chest injuries can be life threatening and must be assessed and treated immediately
2. Penetrating objects should be left in place unless they interfere with the patient's ability to breathe or maintain an airway
3. Penetrating objects must be removed if CPR is necessary
4. All open or penetrating injuries to the chest or abdomen must be sealed with an occlusive dressing
5. Large penetrating objects should be shortened to facilitate transport or provide stabilization
6. Control bleeding with direct pressure around organs, never on top of them
7. Look for multiple entry/exit wounds with any form of penetrating trauma
8. Use sterile solution soaked dressings on protruding organs
9. Administer high flow oxygen and assist ventilations as appropriate
10. Transport patients rapidly to the closest appropriate medical facility
11. Consider ALS intercept early where available

SKILLS:

A. OPEN CHEST (SUCKING CHEST)
   1. Immediately apply manual pressure to seal wound after patient forcibly exhales
   2. Apply and secure an occlusive dressing,
   3. Auscultate for breath sounds
   4. Closely monitor patient for signs of deterioration

B. PENETRATING OBJECT
   1. Stabilize object with hand(s)
   2. If in chest, upper abdomen or neck area , apply occlusive dressing surrounding the base of the object

TEACHING POINTS

3. Stack bulky dressings in alternating layers to stabilize object from all sides
4. Secure dressings with bandage to control bleeding and immobilize the object
5. Restrain patient's hands as necessary to prevent patient from removing object
6. Transport rapidly in position of comfort

C. ABDOMINAL EVISCERATION
1. Cover exposed or protruding organs with a sterile dressing moistened with sterile saline
2. Cover with occlusive dressing to prevent moisture loss
3. Cover with bulky dressings to preserve body warmth
4. Secure dressings loosely in place
5. Transport patient in supine or lateral recumbent position with knees flexed

D. SHOULDER

IMPORTANT POINTS:
1. May be accompanied by fractures or dislocations
2. Suspect C-spine injury with significant MOI

SKILL:
1. Apply sterile dressing to wound and control bleeding with direct pressure
2. Check CMS distal to injury prior to applying bandages
3. Position forearm flexed across chest and bring upper arm along line of body
4. Wrap bandage around body, covering wounded arm and crossing under arm on the uninjured side to secure dressing
5. Recheck CMS distal to injury

E. AXILLARY

IMPORTANT POINTS:
1. Dressing of axillary wounds can easily impair circulation. Check CMS often

SKILL:
1. Apply sterile surface of dressing to wound and control bleeding with direct pressure
2. Check CMS distal to injury prior to applying bandages

TEACHING POINTS

3. Add dressings over the first to achieve bulk as necessary
4. Bandage around injured armpit and shoulder
5. Position forearm flexed across chest, hand pointing toward opposite shoulder. Recheck CMS
6. Wrap bandage around body, over outside surface of arm on injured side and under opposite shoulder
7. Recheck CMS distal to injury

F. EXTERNAL GENITALIA

IMPORTANT POINTS:
1. Preserve the patient's privacy
2. Expose genitalia only if wound is suspected

SKILL:
1. Apply sterile dressing to wound site and control bleeding
2. Secure the dressing by running a bandage over dressing, between legs and around pelvis.

V. EXTREMITIES

IMPORTANT POINTS:
1. Remove patient's jewelry from the affected extremity
2. Elevate extremity to reduce pain and control bleeding, if circulation is present
3. Leave digits exposed whenever possible

SKILLS:

A. HAND
   1. Check CMS
   2. Apply sterile surface of dressing to wound and control bleeding
   3. Place bandage roll or dressing in palm of hand to maintain position of function
   4. Anchor bandage around wrist
   5. Wrap hand to prevent release from position of function
   6. Achieve some restriction of wrist joint movement with bandage
   7. Place hand in elevated position
   8. Recheck CMS distal to injury

Leave fingertips exposed to check CMS
Consider use of splint to restrict movement

TEACHING POINTS

B. AMPUTATION/AVULSION

IMPORTANT POINTS:
1. Save all amputated or avulsed parts. Transport with patient whenever possible
2. Wrap in a sterile dressing
3. Protect in watertight container
4. Keep part(s) cool during transport, but do not allow to freeze

Dry or moist dressing per local protocol

SKILL:
1. Apply sterile dressing to wound and control bleeding with direct pressure
2. Wrap bandage around circumference of extremity and pass bandage several times across end of stump to achieve pressure over bleeding area, then secure with several additional circumferential turns
3. Keep stump elevated, if possible
4. If partially attached:
   a. Fold skin flap back over wound
   b. Secure with sufficient pressure to control bleeding
   c. Keep partial amputation cool

VI. BURNS

IMPORTANT POINTS:
1. Make certain the scene is safe to enter
2. Always take appropriate hazard precautions as well as body substance isolation precautions
3. Burns involving the hands, feet, face or genitalia should be considered critical burns
4. Any burns associated with respiratory injuries are critical injuries
5. Burn patients are especially susceptible to shock (hypoperfusion) and hypothermia.
6. Care must be taken to minimize the potential for infection when dealing with burn patients
7. Never use any type of ointment, lotion or antiseptic
8. Avoid breaking blisters

TEACHING POINTS

SKILLS:

A. THERMAL BURNS
1. Stop the burning process as rapidly as possible using water or saline
2. Remove jewelry and any easily removable clothing or debris from the affected area
3. Continually monitor the airway and breathing for signs of airway impairment or respiratory distress
4. Prevent further contamination of the burned area
5. Cover the wound with a clean and dry dressing
6. Treat for shock
7. Transport

Avoid dressings that may leave fragments in burn injuries

B. ELECTRICAL BURNS
1. Do not attempt to remove a patient from the electrical source unless trained to do so
2. Do not touch a patient unless you are certain s/he is no longer in contact with the electrical source
3. If appropriate, and after assuring no electrical threat remains, stop the burning process as rapidly as possible using water or saline
4. Remove jewelry, and any easily removable clothing, or debris from the affected area
5. Continually monitor the airway and breathing for signs of airway impairment or respiratory distress
6. Prevent further contamination of the burned area
7. Treat any soft tissue injuries or fractures associated with the burn. Look for multiple entry/exit wounds
8. Cover any exposed burned area with a dry, sterile dressing
9. Treat for shock
10. Transport

C. CHEMICAL BURN

1. Always consider the potential impact of hazardous materials. Patient(s) should not be transported until primary decontamination is completed
2. Brush dry powders off prior to flushing
3. Remove jewelry and any easily removable clothing or debris from the affected area
4. Flush the affected areas with large quantities of water or saline
5. Continue flushing the contaminated area(s) during transport
6. Do not contaminate uninjured or unaffected areas while flushing
7. Continually monitor the airway and breathing for signs of airway impairment or respiratory distress
8. Prevent further contamination of the burned area
9. Treat any soft tissue injuries associated with the burn
10. Treat for shock
11. Transport

TEACHING POINTS

Refer to Emergency Response Guidebook or other resources

TEACHING POINTS

SECTION 8 – PNEUMATIC ANTI-SHOCK GARMENT

OBJECTIVES:
1. To define the indications and contraindications for the use of the pneumatic compression trousers
2. To define the manner in which the PASG can be used to stabilize suspected pelvic fractures and apply circumferential pressure to suspected intra-abdominal bleeding accompanied by signs of shock

IMPORTANT POINTS:
1. PASG may be applied without inflation to any patient having the potential to develop shock. A systolic blood pressure of 90 mm HG or less, associated with signs and symptoms is generally regarded as a prime indicator for inflation. However, protocols vary
2. Inflate the PASG based on protocol
3. The only absolute contraindication to inflation is pulmonary edema
4. There are relative contraindications to inflation of all three compartments
5. Inflation should be only to a level at which shock symptoms subside. Careful and frequent monitoring of the vital signs after inflation is essential
6. Do not deflate in the field unless ordered to do so by medical control

   NOTE: Extreme circumstances may arise when the PASG may be deflated in the field, but only under authority of Medical Control. (Field deflation is not a generally accepted practice)

SKILL:
- A. INFLATION
  1. Assess patient for and record signs/symptoms of shock. If spinal injury is suspected, maintain spinal stabilization
  2. Determine and record the patient's blood pressure
  3. Leave deflated blood pressure cuff in place on patient
  4. Auscultate breath sounds — Check for wet or dry breath sounds
  5. Remove clothing from patient's abdomen and lower extremities
  6. Assess patient's abdomen, pelvis and lower extremities for wounds or fractures. Record findings

TEACHING POINTS

7. Cover any open wounds with sterile dressings and bandage in place
8. Restore alignment of extremity fractures, if possible
9. Contact medical control, if required by local protocol, for permission to inflate garment. If medical control contact is not required, proceed according to local protocol
10. Open and arrange anti-shock garment
11. Apply anti-shock garment
    a. Method One:
        1) Lift patient's lower extremities and buttocks, sliding the garment beneath the patient
        2) If spine injury is suspected, use orthopedic stretcher, log roll or straddle slide to position patient
    b. Method Two:
        1) Loosely secure all three compartments
        2) One rescuer puts pants over his/her arms from the foot end and grasps the patient's ankles
        3) Other rescuers pull garment onto patient like a pair of trousers
12. Verify that the superior edge of the garment is just inferior to the patient's costal margin
13. Secure garment – legs then abdomen
14. Attach inflation pump lines to garment and open all in-line valves
15. Inflate garment until:
    a. Patient's clinical status improves satisfactorily, or
    b. Velcro fasteners begin to crackle, indicating separation, or
    c. Air escapes from relief valve(s)
16. Close all in-line valves
17. Leave inflation pump attached to garment during movement and transport
18. Reassess and record, immediately and at frequent intervals en route to the hospital, the patient's:
    a. Blood pressure
    b. Pulse rate
    c. Respiratory status
    d. Level of consciousness

Teaching points:

- Open all in-line valves on garment except if ordered otherwise by medical control or in cases in which protocol indicates that a specific compartment is not to be inflated
- Monitor respiratory status during inflation. Stop inflation if respiratory distress worsens

TEACHING POINTS

B. PASG DEFLATION PROCEDURE

NOTE: Extreme circumstances may arise when the PASG may be deflated in the field, but only under authority of Medical Control. (Field deflation is not a generally accepted practice)

IMPORTANT POINTS:

1. Deflate the PASG only on the order of a physician who has examined the patient in the emergency department
2. Deflate only after appropriate resuscitative and stabilization measures have been accomplished
3. Deflate only with direct physician supervision

SKILL:

1. Assure the patient has functioning IV lines
2. Assess and record the patient's vital signs
3. Gradually deflate the abdominal section of the garment
   a. Monitor blood pressure carefully
   b. For each 4 - 6 mm Hg drop in the patient's blood pressure, stop deflation and infuse fluids until stabilized at baseline level
   c. If blood pressure continues to drop despite infusion, re-inflate garment and reassess resuscitation
4. After abdominal deflation, gradually deflate each leg segment while monitoring blood pressure and resuscitating as above
5. If blood pressure cannot be stabilized during deflation, garment inflation will be maintained into the surgical setting
6. Following deflation of the garment, blood gases and electrolytes will be assessed and corrected as necessary

SECTION 9 – MUSCULOSKELETAL INJURIES

OBJECTIVES:
1. To immobilize suspected fractures and /or dislocations by adequate immobilization of skeletal structure distal and proximal to the injury site
2. To apply manual stabilization and utilize appropriate splinting techniques
3. To determine the presence or absence of circulation, movement and sensation distal to the injury site
4. To restore normal circulation distal to injury sites whenever possible and appropriate, with one attempt to align with gentle traction before splinting
5. To reduce the potential of further injury to nerves, blood vessels and soft tissue surrounding the injury site
6. To reduce hemorrhage and pain at the injury site and thereby reduce and/or minimize the potential of injury related shock

TEACHING POINTS

Movement to restore normal circulation will depend upon local protocol

GENERAL PRINCIPLES:
1. Control external bleeding, as needed
2. Prevent further wound contamination and reduce the potential of subsequent infection by covering open wounds with a sterile dressing
3. Assess circulation, movement and sensation (CMS) prior to and following splint application; loosen splint, if necessary, to regain pulse
4. Prevent further injury and reduce pain by immobilizing the joint above and below the long bone injury
5. Prevent further injury and reduce pain by immobilizing the bone above and below the joint injury
6. Remove clothing from affected area prior to splinting
7. Pad as appropriate to prevent pressure and discomfort to patient
8. Consider application of cold packs to injury site to reduce swelling
9. Always consider the Mechanism of Injury (MOI)
10. Suspect cervical spine injury with significant MOI
11. Consider shock and prevent/treat as appropriate: oxygen, patient positioning, maintenance of body temperature
12. Use of commercial splints should be in accordance with manufacturer’s directions

TEACHING POINTS

I. THORAX

IMPORTANT POINTS:
1. Provide oxygen and assist ventilations as necessary
2. Monitor patient closely for signs and symptoms of a pneumothorax
3. Stabilize chest wall injuries at the patient's maximum point of exhalation
4. In injuries involving the shoulder girdle, it is important to immobilize the entire shoulder girdle
5. Immobilize in position found, or position where pulse is regained

SKILLS:

A. RIB INJURIES
1. Position forearm of injured side across chest, hand slightly elevated toward opposite shoulder and secure with roller bandage or sling and swathe
2. If using a sling and swathe, place triangular bandage under and over arm with point at elbow and two ends tied around patient's neck. Knot should be to the side of the neck
3. Pin or tie end to form cup to support elbow
4. Transport in sitting or semi-sitting position, if patient's condition allows

Teaching point: Encourage and facilitate deep breathing

B. FLAIL CHEST
1. Immediately apply manual stabilization of the flail segment
2. Secure the flail segment with a bulky dressing
3. Place patient in the supine position or on injured side while maintaining spinal immobilization as appropriate
4. Provide oxygen and assist ventilations as necessary

Teaching point: If circumferential wrap is used, care should be taken to ensure adequate tidal volume

C. SHOULDER INJURIES
1. Check CMS distal to the injury.
2. Splint the arm and shoulder in position found, or the position where a distal pulse is regained. Pad void between arm and chest as appropriate
3. Wrap wide bandage around injured arm and body to serve as a swathe to pull shoulder back and secure injured arm to body
4. Recheck CMS distal to injury

TEACHING POINTS

D. COLLAR BONE (Clavicle)
   1. Sling and Swathe method
      a. Check CMS in the extremity on the injured side
      b. Position the forearm of the injured side across the chest, hand slightly elevated toward opposite shoulder
      c. Place triangular bandage under and over arm with point at elbow and ends tied around neck — *Teaching point: Knot should be placed at side of neck*
      d. Pin or tie pointed end to form a cup to support elbow
      e. Leave fingers exposed to facilitate circulation check
      f. Wrap wide bandage around injured arm and body as swathe to pull injured shoulder back and secure extremity to body
      g. Recheck CMS in the extremity on the injured side
      h. Transport in sitting or semi-sitting position, if patient's condition permits
   2. Figure of Eight technique
      a. Check CMS in the extremity on the injured side
      b. Begin bandage on top of injured shoulder and carry diagonally downward across shoulder blades to opposite armpit
      c. Continue through and around armpit, over shoulder and down across shoulder blades to armpit on injured side
      d. Proceed through armpit and up, over shoulder, to starting point
      e. Repeat procedure for three or more additional turns, overlapping the preceding turn by one-third its width
      f. Hold shoulders up and back with finished bandage, immobilizing fracture
      g. Recheck CMS in the extremity on the injured side
      h. Transport in sitting or semi-sitting position, if patient's condition permits

E. SHOULDER BLADE (Scapula)
   1. Check CMS in the extremity on the injured side
   2. Immobilize with sling and swathe as for clavicle fracture
   3. Recheck CMS in the extremity on the injured side
   4. Transport in sitting or semi-sitting position, if patient's condition permits

TEACHING POINTS

II. EXTREMITIES

IMPORTANT POINTS: (Upper extremities)
1. Apply and maintain manual stabilization of the extremity until the splinting process is complete
2. Align severely angulated fractures with gentle traction unless resistance is felt
3. Do not attempt to replace protruding bone ends into the wound, if present
4. Injuries involving joints should be immobilized in the position found
5. Make one attempt to restore circulation distal to an injury site
6. Avoid applying pressure to the injury site, whenever possible
7. Remove jewelry from injured extremities, place hands in position of function
8. Transport patient in sitting or semi-sitting position, as patient's condition permits—

SKILLS:

A. ARM (Humerus)
   1. Check CMS distal to injury site
   2. Stabilize manually proximal and distal to injury site
   3. First EMT will straighten any severe angulation with gentle traction above and below the fracture site
   4. Place a rigid splint on the lateral aspect of the arm to maintain alignment and secure in place
   5. Apply wrist sling and swathe to the injured arm to hold the arm in place, elevating the hand and immobilizing the shoulder
   6. Recheck CMS distal to injury site

Teaching point: Slings should support the hand and wrist, but should not encompass the elbow

B. ELBOW
   1. Check CMS distal to injury site
   2. Stabilize manually proximal and distal to injury site
   3. Immobilize elbow joint, upper arm and forearm with rigid splint
   4. Secure in place
   5. Recheck CMS distal to injury site

Teaching point: Apply a sling and swathe for support and immobilization, as needed

TEACHING POINTS

C. FOREARM (Radius and Ulna)
1. Check CMS distal to injury site
2. Stabilize manually proximal and distal to injury site
3. Place a rigid splint on the entire anterior aspect of the forearm to maintain alignment and secure in place
4. Wrap splint and forearm with bandage leaving finger tips exposed
5. Apply sling and swathe to keep elbow immobilized and hand pointing slightly upward toward opposite shoulder
6. Recheck CMS distal to injury site

D. WRIST
1. Check CMS distal to injury site
2. Stabilize manually proximal and distal to injury site
3. Immobilize wrist with hand in position of function
4. Secure splint and forearm with bandage leaving wrist and finger tips exposed
5. Recheck CMS distal to injury site

Apply a sling and swathe for support and immobilization, as needed

Capillary refill may be best option for determining circulation for wrist and hand injuries

E. HAND
1. Check CMS distal to injury site
2. Stabilize manually proximal and distal to injury site
3. Immobilize hand in position of function
4. Place a rigid splint on the entire anterior aspect of the forearm to maintain alignment and secure in place, leaving finger tips exposed
5. Keep hand elevated
6. Recheck CMS distal to injury site

IMPORTANT POINTS: (Lower Extremities)
1. Apply and maintain manual stabilization of the extremity until the splinting process is complete
2. Align severely angulated fractures with gentle traction unless resistance is felt
3. Do not attempt to replace protruding bone ends into the wound, if present
4. Injuries involving joints should be immobilized in the position found
5. Make <u>one</u> attempt to restore circulation distal to an injury site

Place PASG on long spinal immobilization device before positioning patient

Do not log roll patient when

TEACHING POINTS

6. Avoid applying pressure to the injury site, whenever possible
7. Watch for the development of hypovolemic shock due to internal hemorrhage associated with pelvic, hip and femur fractures

moving to a rigid support device

F. PELVIC INJURIES

1. Check CMS in both lower extremities
2. Immobilize legs by tying knees and ankles together with bandages, padding between thighs and knees, unless this increases patient's pain
3. Lift and/or slide the patient as a unit on to a long spinal immobilization device or use orthopedic stretcher. DO NOT log roll patient
4. Flex the patient's knees with pillows underneath for comfort, if possible, and secure patient to long spineboard or orthopedic stretcher
5. Recheck CMS in both lower extremities

PASG may be used as a splinting device as well as an anti-shock device per local protocol. -

G. HIP INJURIES

1. Check CMS in both lower extremities
2. Lift and/or slide the patient as a unit onto a long spinal immobilization device or use an orthopedic stretcher. DO NOT log roll patient
3. Support the extremity in the position found using blankets, pillows or similar materials.
4. Secure the patient to the long spinal immobilization device
5. Recheck CMS in both lower extremities

H. THIGH INJURIES (Femur)

TRACTION SPLINT (Hare style)

First EMT:

1. Take position at injured extremity out of the way of person applying splint
2. Check CMS distal to injury site
3. The ankle hitch may be applied at this time
4. Grasp and support the calf with one hand. With the other hand, grasp ankle, or ankle hitch strap, in preparation for lifting
5. Apply traction sufficient to stabilize the injured thigh until traction can be assumed by splint

TEACHING POINTS

Second EMT:

1. Adjust the length of the splint by measuring against the length of the uninjured leg and lock securely in place
2. Position leg support straps on splint with two proximal to the knee, one distal to the knee and one just proximal to the ankle hitch
3. Release traction mechanism and extend traction strap
4. Position splint under injured extremity
5. Extend or attach heel stand to support splint
6. Verify the ischial pad is firmly against the ischial tuberosity
7. Firmly secure groin strap using care not to pinch the external genitalia
8. If not previously done, apply ankle hitch to patient's ankle so as to maintain foot at right angle to leg when traction is applied
9. Attach traction mechanism to ankle hitch
10. Tighten traction mechanism until:
    a. First EMT reports mechanical traction equals manual traction
    b. Patient acknowledges pain relief
11. Readjust leg support straps if necessary with two proximal to the knee, one distal to the knee and one proximal to the ankle hitch — *Teaching point:* Do not place support strap over fracture site
12. Secure leg support straps
13. Recheck CMS distal to injury site
14. Secure patient and splint to long spinal immobilization device

TRACTION SPLINT (Sager style)

1. Check CMS distal to injury site
2. Adjust length of splint
3. Slide groin strap under injured leg. NOTE: Splint may be applied to either the lateral or medial aspect of the leg
4. Secure the groin strap using sufficient padding to insure patient comfort
5. Estimate the size of the ankle and fold down the number of pads needed
6. Apply the ankle harness snugly around the patient's ankle
7. Extend the inner shaft of the splint by holding the shaft lock in the open position and pulling the inner shaft out until the desired amount of traction, per manufacturer's recommendations, is noted on the calibrated wheel
8. Apply the longest strap as high up on the thigh as possible

TEACHING POINTS

9. Apply the second longest strap as low as possible on the thigh
10. Apply the shortest strap over the ankle harness and lower leg
11. Apply figure eight strap around both ankles by slipping the strap under the ankles. Cross strap over the heel and secure buckle snugly
12. Recheck CMS distal to injury site

TRACTION SPLINT (Kendrick Traction Device)

Check manufacturer's instructions

1. Check CMS distal to injury site
2. Apply ankle hitch tightly around the leg, slightly above the ankle
3. Tighten stirrup by pulling the green tabbed strap, until snug under patient's heel
4. Apply upper thigh system by sliding the pronged portion of buckle under the leg, at the knee, and seesaw upward until positioned in groin area. Secure buckle
5. Cinch the groin strap until traction pole receptacle is positioned in line with the iliac crest
6. Extend the traction pole
7. Place traction pole along the lateral aspect of the injured leg, extending approximately eight (8) inches (one pole section) beyond the bottom of the foot
8. Insert pole end(s) into traction pole receptacle
9. Secure yellow elastic strap around knee
10. Place yellow tab end of blue cinch strap (located on ankle hitch) over the dart end of traction pole
11. Apply traction by pulling the red tab end of cinch strap until patient comfort improves
12. Apply upper (red) elastic strap and lower (green) elastic strap around patient's leg and traction pole
13. Recheck CMS distal to injury site

I. KNEE INJURIES
1. Check CMS distal to injury site
2. Splint the knee in the position found
3. Immobilize knee joint with rigid splints
4. Recheck CMS distal to injury site

J. LEG INJURIES (Tibia and/or Fibula)
1. Check CMS distal to injury site
2. Stabilize manually proximal and distal to the injury site.
3. Immobilize with rigid splint(s)
4. Secure in place
5. Recheck CMS distal to injury site

TEACHING POINTS

When using board splints, apply one medial and one lateral to the leg

If using one board splint, apply to the posterior aspect of the leg

K. ANKLE AND FOOT INJURIES
1. Check CMS distal to injury site
2. Stabilize manually proximal and distal to injury site
3. Immobilize with pillow, blanket, or appropriate commercial splinting device, leaving toes exposed
4. Elevate foot and ankle to reduce edema
5. Recheck CMS proximal and distal to injury site.

TEACHING POINTS

SECTION 10 – SPINAL INJURIES

OBJECTIVES:

1. To provide initial manual stabilization to the entire spinal column and head to facilitate a patent airway
2. To restore and maintain normal anatomical alignment of the spinal column and head through application of manual stabilization until appropriate stabilization and immobilization is assumed by a mechanical device
3. To provide total immobilization of the entire spinal column and head through the proper positioning and securing of a spinal injury or suspected spinal injury patient to a mechanical movement/stabilization device
4. To provide stabilization and immobilization of the spinal column and head from the time at which manual stabilization is first initiated and neutral positioning achieved through all patient handling, packaging and transport procedures
5. To determine the presence or absence of circulation, movement and sensation in the patient's extremities

IMPORTANT POINTS:

1. One rescuer is responsible for stabilization of the head, neck and maintenance of the airway
2. Rescuer maintaining manual stabilization directs patient movement.
3. Restoring spinal alignment may be appropriate during the spinal stabilization and immobilization process. However, if resistance to movement of the neck or spine is felt, or the patient experiences an increase in pain, stabilize the patient in the position found
4. In general, a cervical collar should be used during the stabilization/immobilization process. A cervical collar alone is not adequate for protecting the cervical spine
5. Stabilization and immobilization are the only adequate protection for suspected spinal injuries
6. Once immobilization has been completed, the device may be positioned to assist in maintaining a patent airway
7. Patients may be immobilized to a long or short immobilization device using straps, tape, cravats, Velcro closures, commercial devices, etc. Appropriate padding such as blankets, towels, dressings, etc, may be needed to prevent movement of the patient in or on the immobilization device
8. Consider padding board for patient comfort

SKILLS:

TEACHING POINTS

I. SPINAL INJURIES

A. KENDRICK EXTRICATION DEVICE (KED)

First rescuer

1. Stabilize and support the head in a neutral position
2. Maintain stabilization until patient's head is secured to KED

Second rescuer

1. Check CMS in all four extremities
2. Assist in repositioning the patient's body to a neutral position, as necessary
3. Select and apply an appropriately sized cervical collar
4. Prepare and position KED behind patient (Request additional help in positioning patient if necessary)
5. Secure KED with center and bottom chest straps. Assure firm contact of device with lower back and armpits
6. Pad any void between patient's head and the device to preserve neutral alignment as is necessary
7. Secure head to device; first strap over forehead, second strap over chin
   NOTE: The chin strap may be omitted or removed if airway compromise exists
8. First EMT may now release manual stabilization
9. Recheck CMS in all four extremities

It is permissible for rescuers to exchange positions while providing immobilization

Depending on the style of C-collar in use, the chinstrap may be more appropriately placed on the C-collar below the chin

Both rescuers

1. Secure groin and top chest straps, if not done previously
2. Tie hands together and lower extremities together, if necessary
3. Position long immobilization device adjacent to patient
4. Slide and pivot patient; support patient at thighs and with device handles
5. Lower patient to long immobilization device; maintain legs in flexed position
6. Move patient to head of long immobilization device
7. Release groin straps and lower the patient's legs to the long immobilization device. Loosen top chest strap as necessary to facilitate breathing and patient comfort
8. Secure patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary
9. Recheck CMS in all four extremities

Groin strap must be properly positioned under the mid-line of each buttock to properly secure device to patient

Reassess head, strap placement and tension

TEACHING POINTS

B. SPINAL INJURY – XP-ONE (XP-1) (Optional)

First rescuer

1. Stabilize and support the head in a neutral position
2. Maintain stabilization until patient's head is secured to XP-1

Second rescuer

1. Check CMS in all four extremities
2. Assist in repositioning the patient's body to a neutral position, as necessary
3. Apply Med-Spec extrication collar
4. Prepare and position XP-1 behind patient (Request additional help in positioning patient if necessary)
5. Secure XP-1 with center and bottom chest straps. Assure firm contact of device with lower back and armpits
6. Secure head to device, choose appropriate tabs and attach them to the Velcro on both sides of the collar. Place forehead pad on patient and attach tabs

It is permissible for rescuers to exchange positions while providing manual stabilization

Both rescuers

1. Secure groin straps
2. Apply top chest strap; draw shoulder straps down, loop Velcro around top on top and middle chest straps and secure in place
3. Position long immobilization device adjacent to patient
4. Slide and pivot patient; support patient at thighs and with device handles
5. Lower patient to long immobilization device; maintain legs in flexed position
6. Move patient to head of long immobilization device
7. Release groin straps and lower the patient's legs to the long immobilization device. Loosen top chest strap as necessary to facilitate breathing and patient comfort
8. Remove chin strap, if needed, to assure an airway
9. Secure patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary
10. Recheck CMS in all four extremities

TEACHING POINTS

C. LONG SPINEBOARD - Standing Patient

IMPORTANT POINTS:
1. A standing patient with a potential spinal injury must be moved to a supine position as soon as possible
2. Manual stabilization of the patient's head and neck can be maintained from either the front or the back of the patient depending on the rescuer's height. Shorter rescuers may need to stabilize from the front of the patient
3. While holding manual stabilization from the rear, communicate with team members as your view of the patient will be obstructed by the immobilization device

SKILL:
1. Maintain manual stabilization of the patient's head, neck and spine
2. Check CMS in all four extremities
3. Select and apply a cervical collar
4. Position the long spinal immobilization device behind the patient being certain it is centered directly behind the mid-line of the patient
5. Two rescuers face the patient and stand on either side
6. The two rescuers place their arms that are closest to the patient, under the patient's arms and grasp the device just above the patient's armpit
7. The two rescuers, with their free hand, grasp the patient's arm at the elbow or the board to maintain a secure grip as the device is tilted backward
8. The device is then tilted backward to the ground
9. The patient's torso and lower extremities are secured to the device, followed by the patient's head, padding as necessary to maintain neutral alignment
10. Recheck CMS in all four extremities

D. SLING AND LONG SPINEBOARD

First rescuer
1. Stabilize and support the head in a neutral position

Second rescuer
1. Check CMS in all four extremities
2. Select and apply an appropriately-sized cervical collar
3. Position sling across chest and under armpits of patient and tighten around body

TEACHING POINTS

4. Secure patient's hands together if possible
5. Position long spineboard at slight elevation to patient's longitudinal axis. Support at this angle while pulling patient
6. On command, pull patient slowly onto board keeping sling close to board at all times as First rescuer guides patient's body and maintains stabilization of the head
7. As first rescuer approaches head of board, lower board gently and move back as pull is completed
8. Secure patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary
9. Secure patient's head to long spineboard, padding as necessary
10. First rescuer may then release manual stabilization
11. Recheck CMS in all four extremities

E. LOG ROLL AND LONG IMMOBILIZATION DEVICE (Patient Supine – 3 Rescuers)

First Rescuer

1. Stabilize and support the head in a neutral position
2. Maintain stabilization until patient's head is secured to long immobilization device

Second and Third Rescuers

1. Check CMS in all four extremities
2. Select and apply an appropriately-sized cervical
3. Tie patient's lower extremities together
4. Second rescuer raises patient's near arm over patient's head to prevent arm from obstructing roll or places arm along patient's side with hand against thigh
6. Second and third rescuer s reach across patient and place their hands along patient's body evenly spaced between shoulder and knees
7. On signal from first rescuer, second and third rescuer s roll patient toward them, maintaining spinal alignment
8. Second and third rescuer s each use hand closest to patient's feet to position the long immobilization device on the floor next to the patient's back
9. On signal from first rescuer, all roll the patient back onto long immobilization device and lower arm to side

Hand spacing may be adjusted to accommodate patient's weight and height

10. If centering of the patient is necessary; on signal from first rescuer, slide patient with gentle even motion while maintaining spinal alignment
11. Third rescuer secures patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary
12. Second rescuer secures patient's head to long immobilization device, padding as necessary to maintain neutral alignment
13. First rescuer may then release manual stabilization
14. Recheck CMS in all four extremities

TEACHING POINTS

The patient may be centered through the use of either direct lateral movement or the "Z" method, which combines longitudinal and lateral movement

F. LOG ROLL AND LONG IMMOBILIZATION DEVICE (Patient Prone or on side – 3 Rescuers)

First Rescuer

1. Stabilize head, neck and spine in position found

Second and Third Rescuers

1. Check CMS in all four extremities
2. Secure patient's lower extremities together
3. Place long spinal immobilization device parallel to the patient so the back of the patient's head is next to the board
4. Both rescuers kneel on board facing the patient with second rescuer at the patient's chest and third rescuer at the patient's thighs
5. Second rescuer raises patient's arm nearest the device and positions it over the patient's head or along side the patient's body with the hand against the thigh
6. Second and third rescuer s reach across patient and place their hands along patient's body evenly spaced between shoulder and knees
7. On signal from first rescuer, second and third rescuer s roll patient toward them onto long immobilization device
8. As patient is rolled, first rescuer brings head into neutral position, if possible, achieving spinal alignment (If resistance is felt, head is stabilized at that point)
9. If centering of the patient is necessary; on signal from first rescuer, slide patient with gentle even motion while maintaining spinal alignment
10. Third rescuer secures patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary
11. Second rescuer selects and applies an appropriately-sized cervical collar, then secures patient's head to long immobilization device, padding as necessary to maintain neutral alignment

TEACHING POINTS

Hand spacing may be adjusted to accommodate patient's weight and height

The patient may be centered through the use of either direct lateral movement or the "Z" method, which combines longitudinal and lateral movement

TEACHING POINTS

12. First rescuer may then release manual stabilization
13. Recheck CMS in all four extremities

G. ORTHOPEDIC STRETCHER (Two Rescuers – Patient Supine)

First Rescuer

1. Stabilize head and neck in neutral position

Second EMT

1. Check CMS in all four extremities
2. Select and apply cervical collar
3. Adjust stretcher to height of patient
4. Place one half of stretcher on each side of patient
5. Slide stretcher halves under patient and latch head end together
6. Close foot end of stretcher being careful not to pinch patient
7. Secure patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary
8. Secure patient's head to orthopedic stretcher, padding as necessary to maintain neutral alignment
9. First EMT may then release manual stabilization
10. Recheck CMS in all four extremities
11. Place and secure patient to a long board

Stretcher should remain closed when length is adjusted

A bystander may be used to gently lift patient to help avoid pinching when closing stretcher halves

H. STRADDLE SLIDE (4 Rescuer minimum)

First Rescuer

1. Stabilize head, neck and spine in neutral position

Second, Third and Fourth Rescuer s

1. Check CMS in all four extremities
2. Select and apply an appropriately-sized cervical collar
3. Second and third rescuer s straddle patient facing first rescuer
   a. Second rescuer bends and places hands under patient's chest below the shoulders
   b. Third rescuer bends and places hands under patient's pelvis
4. Fourth rescuer positions long spineboard lengthwise at the patient's head or feet
5. At signal from the first rescuer, second and third rescuers lift patient just enough to allow the long spineboard to pass under the patient's body
6. Fourth rescuer slides long spineboard under patient in one smooth, unbroken movement

TEACHING POINTS

7. On signal from first rescuer, second and third rescuers lower patient on the long spineboard
8. If centering of the patient is necessary; on signal from first rescuer, slide patient with gentle even motion while maintaining spinal alignment
9. Third rescuer secures patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary
10. Second rescuer secures patient's head to long spineboard, padding as necessary to maintain neutral alignment
11. First rescuer may then release manual stabilization
12. Recheck CMS in all four extremities

J. HELMET REMOVAL

IMPORTANT POINTS:
1. The ability to maintain an airway is of ultimate importance when managing helmeted patients
2. Stabilization and immobilization are the only adequate protection for suspected spinal injuries
3. Consideration should be given to leaving a well fitting helmet, which allows ready access to perform all necessary airway maneuvers, in place
4. Proper immobilization of patients wearing helmets and other protective equipment often requires the patient's body or head to be padded to maintain appropriate neutral position

SKILL:
1. Open faced helmets/half helmets
   a. From the cephalic position, first EMT provides manual stabilization by placing one hand on each side of the helmet with the fingers on the mandible
   b. Second EMT removes the face shield, then and unfastens the restraining strap
   c. Second EMT places one hand on each side of the patient's neck with thumbs resting against the angle of the jaw and the fingers extending behind the occiput to support the patient's head and maintain manual stabilization
   d. First EMT then removes the helmet by grasping the straps or edges of the helmet to spread it as it is gently pulled along the long axis of the body and tilted slightly forward
   e. Throughout the removal process, the second EMT maintains manual stabilization of the patient's head and neck

Glasses, microphones, head-sets or other obstructions must be removed before attempting to remove the helmet

f. First EMT resumes control of manual stabilization
g. The second EMT selects and applies an appropriately-sized cervical collar in preparation for moving the patient to a long immobilization device
h. EMTs move patient to long immobilization device using appropriate technique as previously described in this section

TEACHING POINTS

If the patient is wearing other protective equipment, once the helmet is removed, care must be taken to pad between the occiput and the immobilization device to maintain the head in a neutral alignment

2. Closed face (full face) helmet - (Minimum of three rescuers) Assumes a well fitted helmet and no immediate life-threat due to airway obstruction or respiratory arrest
   a. Patient is positioned on long spineboard using appropriate technique as described previously in this section
   b. While maintaining manual stabilization, the head end of the long immobilization device is elevated approximately three inches from the horizontal and firmly blocked in that position
   c. While the First EMT maintains manual stabilization from the cephalic position, the Second and Third EMTs straddle the patient and the long spineboard
   d. Second EMT grasps the patient under the armpits while Third EMT grasps patient at the pelvis
   e. On signal from the First EMT, the patient is moved up the long spineboard until the lower rim of the helmet is just beyond the top edge of the board
   f. While the Third EMT continues to stabilize the patient's body, the Second EMT places one hand on each side of the patient's neck with thumbs resting against the angle of the jaw and the fingers extending behind the occiput to support the patient's head and maintain manual stabilization
   g. Second EMT assumes manual stabilization of patient's head and cervical spine
   h. When advised by Second EMT that s/he has assumed manual stabilization, First EMT slowly releases manual stabilization
   i. First EMT insures that any objects which could obstruct helmet removal (glasses, microphones, headset, etc) have been removed from the patient and/or helmet, then loosens and unfastens the helmet restraining strap
   j. First EMT then removes the helmet by grasping the straps or edges of the helmet to spread it as it is gently pulled along the long axis of the body and tilted slightly rearward to clear the patient's nose
   k. Once the lower edge of the helmet has cleared the patient's nose, the helmet is tilted slightly forward and removed

Second EMT may continue to straddle the patient or may move off to one side when assuming C-spine stabilization

l. First EMT resumes manual stabilization of the patient's head and cervical spine
m. Second EMT grasps patient under armpits
n. On signal from First EMT, all EMTs slide the patient down the long spineboard until s/he is properly positioned
o. C-collar is applied and patient is secured to long spineboard using appropriate technique as previously described in this section

3. Football Helmet (Patient supine)
   a. First EMT provides manual stabilization by placing one hand on each side of the helmet with the fingers on the mandible
   b. Second EMT removes the face shield by using paramedic shears to cut the nylon straps holding the shield in position
   c. Second EMT then unfastens chin strap(s) at the side snaps, removing it completely
   d. Using the closed trauma shears as a lever, the second EMT pries the lower lateral interior pads from the helmet and removes them
   e. If the helmet is equipped with an air bladder, the second EMT releases the air valve of the helmet and deflates the bladder
   f. Second EMT places one hand on each side of the patient's neck with the thumbs resting against the angle of the jaw and the fingers extending behind the occiput to support the patient's head and maintain neutral alignment
   g. First EMT then removes the helmet by grasping it's edges to spread it as it is gently pulled along the long axis of the body and tilted slightly forward
   h. Throughout the removal process the second EMT maintains manual stabilization of the patient's head and neck
   i. First EMT resumes control of manual stabilization
   j. Second EMT selects and applies an appropriately sized cervical collar in preparation for moving the patient to a long immobilization device
   k. EMTs move the patient to a long immobilization device using appropriate technique as previously described in this section
   l. The second EMT pads as necessary under the patient's head to maintain neutral alignment
   m. Patient is secured to long immobilization device using appropriate technique as previously described in this section

TEACHING POINTS

Depending on the style of helmet being worn, it may be necessary to use a closed face helmet procedure to remove the helmet

Coaching or trainer staff may be able to assist with equipment removal

Shoulder pads may elevate the patient's body to an extent that traditional immobilization devices will no longer provide adequate immobilization

If the patient is wearing other protective equipment, extreme care must be taken to insure spinal alignment is maintained both during the log roll and once the helmet is removed

Additional care must be taken to pad between the occiput and the immobilization device to maintain the head in a neutral position

Glossary of Common Abbreviations

ABCs................ **Airway Breathing & Circulation**
AED.................. **Automated External Defibrillator or Defibrillation**
AHA.................. **American Heart Association**
ALS .... **Advanced Life Support**
ARC.................. **American Red Cross**
ASA.................. **Aspirin**
AVPU .... **Alert, Verbal, Painful, Unresponsive**
BLS .... **Basic Life Support**
BP .... **Blood Pressure**
BSA.................. **Body Surface Area**
BSI .... **Body Substance Isolation**
BVM .... **Bag-valve Mask**
CC .... **Chief Complaint**
cc .... **Cubic Centimeter**
CO_2.................. **Carbon Dioxide**
C-spine .... **Cervical Spine**
CID/HID .... **Cervical Immobilization Device/Head Immobilization Device**
CMS .... **Circulation, Movement & Sensation**
CNS.................. **Central Nervous System**
CPR.................. **Cardiopulmonary Resuscitation**
CSF .... **Cerebral Spinal Fluid**

DCAP/BTLS ..... Deformities, Contusions, Abrasions, Penetrations, Burns, Tenderness, Lacerations, Swelling

dL .... Deciliter

EMS .... Emergency Medical Services

EMT .... Emergency Medical Technician

ET .... Endotracheal

ETC .... Esophageal Tracheal Combitube

IM .... Intramuscular

IV .... Intravenous

IVP .... Intravenous push

KED .... Kendrick Extrication Device

kg .... kilogram

KTD .... Kendrick Traction Device

lbs .... Pounds

LOC .... Level of Consciousness

lpm .... Liters per Minute

MAST .... Medical (or Military) Anti-Shock Trousers

mg .... Milligram

mL .... Milliliter

mmHg .... Millimeters of Mercury

MOI .... Mechanism of Injury

NOI .... Nature of Illness

NPO .... Nothing by Mouth

NTG .... Nitroglycerine

O_2 .... Oxygen

OB .... Obstetrics

OPQRST .... Onset, Provocation, Quality, Radiation, Severity, Time

PASG .... Pneumatic Anti-Shock Garment

PO .... By mouth

prn .... as needed, as desired, as necessary

PSI .... Pounds per square inch

pt .... patient

SAMPLE .... Signs & Symptoms, Allergies, Medications, Past pertinent medical history, Last oral Intake, Events preceding incident

SC .... Subcutaneous

SIDS .... Sudden Infant Death Syndrome

SL .... Sublingual

SQ .... Subcutaneous

SOB .... Shortness of Breath

SpO_2 .... Saturation percentage of oxygen

S/S .... Signs & Symptoms

USP .... United States Pharmacopia

VS .... Vital Signs

> .... Greater than

< .... Less than